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Original Contributions.

OPENING THE BITE WITH BURNISHED TIPS.

By M. C. Smith, D.D.S., Lynn, Mass. Read Before the Massachusetts Dental Society, June 1 and 2, 1898.

The title of this paper was sent in before the paper was written, or it probably would have been "Opening the Bite with Combination of Crowns and Burnished Tips." First we will consider the conditions which seem to demand the opening of the bite, which can be better explained by a perusal of the following cases:

Case 1. Mr. D. The teeth were wearing away very rapidly on the occluding surfaces, the enamel in some places being through and

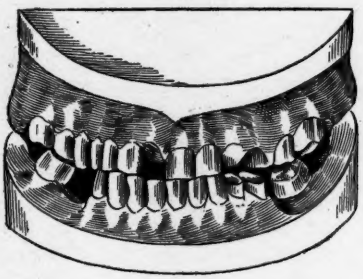

Fig. 1.

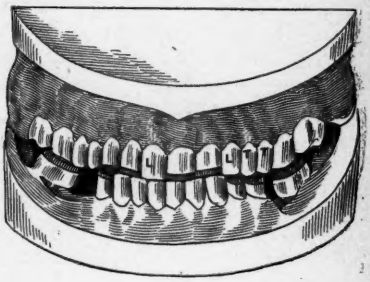

Fig. 2.

deep holes worn into the dentin. The teeth were so sore that eating had become painful, and something had to be done, as the teeth, gums and mucous membrane of the mouth were in a hypersensitive condition. He had lost some of his teeth, which partly accounted for this condition. With a combination of caps and burnished pieces the bite was opened and a good masticating surface procured. When completed no part of tooth struck tooth, but in all cases struck gold, and ceased to wear. The teeth soon got over their sensitiveness and eating again became a pleasure.

Case 2. Rev. Mr. G. had lost his first and second molars; the only teeth which occluded were the third molars, bicuspids and one cuspid; the teeth that occluded were worn away almost to the gingival border of the gums. He complained that eating was painful and dreaded to dine out, as anything acid or sweet, hot or cold, was unbearably painful. His tongue and cheeks were continually sore from irritation of the sharp edges of the teeth, and as there had been several deaths in his family from cancer, a continual irritation in the mouth was not conducive to his peace of mind. Also in talking, if he closed his mouth quickly the tongue was thrown backward into the pharynx and gave him a gagging sensation. A gold cap was applied to one of the molars on the lower jaw and burnished pieces to the other and the bicuspids, which opened the bite about 3-32 of an inch. The success was so great that I applied two gold caps to the upper molars and burnished pieces to the bicuspids and one cuspid, opening the bite 3-16 of an inch in all. Where the bite is opened twice great care must be taken that both sides are the same thickness, for a very little deviation of the lower jaw from the median line, while taking the bite, may make one side considerable longer than the other. In this case the teeth were so sensitive that it was impossible to drill the holes so deep as I wished, but only one tip came off in four years and was easily reset. The result was more than satisfactory.

Case 3. Mr. S. H. The cuspids and incisors had been doing all the work and had worn away, leaving deep pits in them so that it was impossible to masticate food with any degree of satisfaction. In this case the bite was not opened, but the sharp edges of the lower teeth ground away. Cases 1, 2 and 3 were done in the early part of '94.

Case 4. Mrs. P. Sensitiveness, shortening of the face, unsightly wearing of the teeth, etc. Five tips and a gold cap.

Case 5. Mrs. M. An unnatural shortening of the face and a growing separation of the anterior teeth, due probably to injudicious extracting in early life.

Case 6. J. M. Paralysis of the right seventh nerve, giving a baggy expression to the cheeks, due to the relaxed muscular condition.

Case 7. Mrs. M., age 75, insisted on having all her upper teeth removed, as they had worn short and gave an old, unnatural expression to the face that did not belong to her. A few years previous

she had been told by a dentist of considerable repute that it was impossible to do anything with her teeth, consequently she let them go. Fig. 1 will show first appearance of the mouth; fig. 2 as it looked when completed; where you see "L" marked over a tooth it indicates a Logan crown; "T" a tube crown; the dark is where the burnished gold pieces were inserted. It was surprising what a difference that lengthening made in her facial expression and it gave her a good masticating surface.

Figs. 3 and 4 are cases where I should recommend opening the bite with tips.

My method of making tips is as follows: Grind off the edges of the tooth until you get a clean smooth edge of enamel (no matter

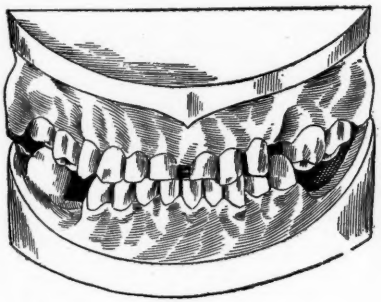

Fig. 3.

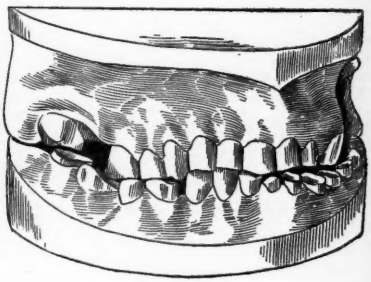

Fig. 4.

about the center of the tooth, for the rougher the surface the better cement will hold), then with a sharp drill make from two to four holes, as may be required—two for a lateral and four for a molar, as near the enamel as strength of tooth will permit, and in any position where you feel least likely to strike the pulp, bearing in mind that where the tooth is so much worn away the pulp is apt to be very near the surface. In case you should strike the pulp-chamber, stop at once, and before you allow any moisture in the drill-hole, fill as carefully as you would any recent exposure. That is an accident that will seldom happen, however. If necessary now enlarge with a bur, less than ⅛ of an inch is deep enough. Next take a piece of pure gold of whatever thickness you can work best, remembering that the thicker the gold the less likelihood there is of its melting, and the beginner would better take a piece of platinum. With your

thumb press the gold onto the tooth and you can get a good impression; pick a hole through the gold and insert the pin. This is best made from platinum wire cut to the length desired and a little head hammered on; or take a very small piece of gold trimmings, put on a minute piece of 22k solder, catch the pin in your tongs, bring pin onto gold, solder together and then cut to any length desired. Insert the pin through the gold and press home, the head that you have soldered on will help retain the pin in place; remove all, place on a piece of charcoal, touch with a minute quantity of borax, add a very small piece of 22k solder and solder together, return to the mouth, and if you have made any mistake it is easily corrected. Now insert another pin and proceed as before. When the pins are all in place, flow a little solder from one pin to the next, so as to

Fig. 6.

Fig. 5.

Fig. 7.

Fig. 8.

Fig. 10.

Fig. 9.

Fig. 11.

Fig. 12.

stiffen your work, replace the piece on the tooth and burnish down the edge about one-fourth way around the tooth, remove and flow solder over what you have burnished. Don't burnish too much at a time or it may curl up and spoil. After the edge is all stiffened trim the gold, leaving a little to come over the edge and prevent the solder running over the edge and underneath. Next take a piece of thin 22k plate, the right size, punch a hole in the center and burnish it onto the piece; remove from the mouth, place 20k solder over hole and draw the solder down from center, adding more solder at the center each time; continue this process until you have the desired thickness, finishing up with 18 or 20k, so as to give it the desired hardness. Those pieces can be ground mostly out of the mouth, thus saving the patient a great deal of discomfort, and when set with a good cement they wear well.

Fig. 5 shows the tooth prepared for the tip, the edges are ground

smooth and the holes are drilled. Fig. 6 is the first piece of gold, with the pins soldered in their respective places and the edge burnished over. Fig. 7 shows the tip in position on the tooth, all ready for the next piece of gold. Fig. 8 is the tip completed and set in place; the gold can be of any desired thickness.

Another burnished tip that has its place in dentistry is used for central and laterals, where the teeth have two approximal cavities and perhaps the cutting edge frayed or worn away. Remove the decay, fill with cement, grind the tooth to a wedge-shape and across the cutting edge, groove the cement and the tooth a little; then burnish a piece of gold down one side, stiffen with solder, and burnish another side, and so on until the three sides are burnished to a perfect fit; then add solder or gold plate enough to the desired size, and after grinding set with cement.

Fig. 9 shows tooth prepared, with sides and cutting edge ground away ready for the tip. Fig. 10 the gold burnished down the two sides and across end of tooth. Fig. 11 the lingual aspect of tooth with tip set; the gold is burnished clear across to give strength to the piece. Fig. 12 shows tooth as completed and set; if the work is carefully done but few can observe any line of cement between work and tooth.

GENERAL OUTLINE OF CAVITY PREPARATION.

By W. E. Maybee, D.D.S., Galesburg, Ill. Read Before First District Dental Society of Illinois, at Monmouth, Sept. 27–28, 1898.

There is a set of rules given in the text-books concerning this subject, but most of us fail in some part which is very essential to the preservation of the teeth, and the object of this paper is to emphasize some of the details which are sometimes neglected.

The subject is a broad one and I shall therefore confine myself to approximal cavities in the six anterior teeth. The first step is to gain free acccess to the cavity, either by separation or by the sacrifice of tooth structure, so break down all frail walls with a sharp chisel, both labially and lingually, so that all parts of the cavity can be seen. Every cavity should tend to rotundity, avoiding angles in its outline. When prepared for filling it should be so formed that it will be self-cleansing when filled. In other words, cut away enough that the filling will not touch the adjacent tooth, or a recurrence of decay is certain. So shape and extend the cavity that

when filled the palatal surface will be kept clean by the action of tongue and the labial surface by the lips.

The borders of a cavity should be heavy, especially the palatal, supported by dentin, and beveled at all points except the anterior surface, which should be heavy but not beveled, as when filled and polished it would present a ragged appearance. To avoid this, trim the edge with a sharp chisel until it presents a defined and artistic outline, so that the juncture of enamel and filling will show an even surface.

Care should be taken in extension of the cavity far enough on the labial surface that the cavity will not stand in the shadow of the adjoining tooth, for when filled it would present a dark appearance.

Another vulnerable point is the cervical border. Cut the tooth until the cavity extends under the free margin of the gum, (although this is not necessary in all teeth.) Extend the cavity to cervical face and bevel with a round bur, so that the filling may overlap at this part, and to the cutting edge or near it, so that filling will extend beyond the point of contact with adjoining tooth.

IMPORTANCE OF ESTABLISHING A TECHNIC AS WELL AS LITERARY STANDARD FOR COLLEGE ENTRANCE.

By S. H. Guilford, D.D.S., Ph.D., Philadelphia. Read Before the National Association of Dental Faculties, at Omaha, Aug. 29, 1898.

The good results accomplished by this association in its sixteen years of existence are not only universally conceded, but will ever remain as proof of the wisdom of its organization and its general endeavors to elevate the standard of practice. It was realized that this could be done only by sending into the profession men better equipped for practice than the majority of those then entering it. This required certain changes in the prevailing methods of college instruction, some of which have gradually been brought about, while others are in course of development. The association first addressed itself to lengthening the course of study. The recognition of five years' practice as an equivalent of one year's course in college was done away with and an invariable two years' course demanded. Then came the lengthening of the winter term from four to five and subsequently to six months, after which another year was added to the college curriculum.

With all these advancements however, beneficial as they were in

their results, it was found that a proportion of the yearly graduates were not up to the standard demanded either by the public or the profession, and another change became necessary to remedy the condition. At the time of the organization of this association, and for many years afterward, there were very few dental colleges that inquired into the earlier educational training of those who applied for admission. It seemed to have been taken for granted that anyone applying for admission must have had sufficient mental training to enable him to grasp and pursue the various studies of the curriculum. This proved to be erroneous, for it was found that while a student might by close application manage to pass his examination in the theoretical branches, he did not have that general grasp of these subjects which was necessary to make him a well-rounded man.

Following this discovery came the adoption of entrance requirements, which necessitated a certain amount of mental training in the schools before the candidate could be allowed to begin his collegiate studies. These requirements were very moderate at first, but were gradually increased until they equaled the completion of a full grammar course. Thus far the plan had worked admirably, principally because it was gradual. Two years ago however, a further advance was decided upon by which in the course of a few years the entrance requirements were to equal completion of a high school course. This change was so radical in character that it worked a hardship upon many students who were not able to meet it, and who in consequence were debarred from college entrance. As a result of this, one year ago the latest advance was annulled and the requirements reduced to their previous standard. This retreat from an advanced position was regretted by many schools, and the question of some advancement from our present standard will doubtless come before the association at its present meeting.

In anticipation of this your essayist decided to prepare this paper for the purpose of presenting certain views upon the subject and offering them for your consideration. As previously mentioned, the raising of the entrance requirements to equal a completed grammar school course has proven itself a wise act, and none has cause to regret it. With less preparatory training it was found that the student's mental faculties had not been properly awakened nor correct habits of study formed, and that he was in consequence placed at a

disadvantage in trying to acquire a knowledge of at least some of the more abstruse subjects which he was expected to master.

In view of the fact that the advancement to the present standard has worked well, the question naturally arises as to whether a further advancement would not be advisable, and, if so, what form it should take. Strange to say, we have thus far been viewing and treating the subject of preliminary requirements from a single standpoint. All of our discussions as well as our enactments have dealt solely with the mental acquirements and possibilities of the proposed student, entirely overlooking or ignoring the equal or more important feature of manual dexterity or mechanical bent.

All of us are fully aware of the absolute importance of mechanical talent in the practice of our profession, and we are equally cognizant of the fact that unless this talent is innate it will always be lacking, for it cannot be acquired. No amount of training and instruction can develop a skillful mechanic out of one who lacks the mechanical instinct. If this be so, is it not important that we as teachers see that those who place themselves under our care for preparation for their life-work are possessed of this necessary qualification? In former times, before the wave of progress had swept across the beaten path of dental education, when the student received his preliminary and at times the greater part of his dental training in a preceptor's office, or rather laboratory, it was an almost universal custom for the practitioner, before accepting a student, to ascertain whether he possessed a natural bent in the line of mechanics. This was done by inquiring into the young man's turn of mind, his fondness for tools and their employment in constructing some of the simple mechanisms so necessary to the complete happiness of boyhood. In addition to this it was customary to accept the student for a certain period upon probation, to still further ascertain his adaptability to his purposed life-work.

While in these later times we recognize the shortcoming of our predecessors in not demanding at least some educational requirements from their students, may we not at the same time take a hint from their methods, and incorporate some of their requirements into our own? In other words, has the time not arrived when we should demand mechanical talent as well as scholastic acquirements as preliminaries to entrance upon the study of dentistry?

It would seem that in this matter as in many others we have been

rather blindly following in the footsteps of our sister profession, medicine, not fully appreciating the differences that exist between them. Dentistry occupies rather a unique position among the sciences and professions, in that to be of the greatest service to mankind the practitioner must necessarily be possessed of considerable manual dexterity. This is not required of the lawyer, the theologian, nor the physician in ordinary practice, for their success depends mainly if not entirely upon the development and use of their mental faculties. For one undertaking the study of any of these professions it is therefore quite proper that the only qualification demanded should be a scholastic one.

Should the student of medicine prove to be possessed of mechanical talent, he will after graduation naturally drift into the special practice of surgery, which will be more to his taste and afford him a better field for the employment of manipulative skill. Should his taste not run in the mechanical line, he still has in the domain of general practice and some of his specialties a large field for successful effort. With us it is different. To properly serve the needs of his patients the dentist must be skillful with tools, for so large a part of his daily work is manipulative in character. If he lacks this skill he must prove a failure, for in the practice of dentistry there is no place for the employment of the mental faculties alone as there is in medicine.

The vocation of the instrumental musician bears some little resemblance to our own, in that it requires for its successful pursuit not only the development of the mental and esthetic qualities, but an absolute dependence upon manipulative ability. Without the latter the former quality would be of no avail. A teacher of instrumental music would probably prefer to have as his student one with a liberal education, for he would add luster to his chosen calling; but he would certainly not accept or retain as a pupil, no matter what his literary attainments might be, one who was lacking in technical ability or possibility. Why, therefore, should we do less?

The dentistry of to-day owes much of its progress and high standing to the class of men who entered it from thirty to sixty years ago under the private studentship system. Almost without an exception they were men possessed of a high order of mechanical and inventive ability, and they were so because they were selected from the mass by their preceptors. It therefore seems to me that it

would be only the part of wisdom for us to so amend our requirements as to include manipulative ability, and where this is lacking to reject the student and advise him to take up some other calling. It certainly does not seem just to accept a student who is by nature lacking in that quality which is absolutely essential to his success in practice.

With our greatly improved methods of systematic technic instruction we have certainly accomplished good results with the material given us, but how much better might have been the results with the material properly culled. Many students, as we all know, manage to work along through college, performing their allotted tasks and passing the required examinations, who we are morally certain will not be successful in practice, because all that they accomplished was performed in a labored way, without any display of actual skill. Are we just to them and to the public in permitting this? Should we not discover the lacking quality before accepting them, or find some way of discovering it in the early part of their course and kindly advise them to change their vocation? If by some extra effort on our part we were able to develop skill where natural ability is lacking the conditions would be different, and we would be relieved from the necessity of considering the question; but we cannot grow the plant where seed or soil is lacking.

The question now arises, What shall the mechanical standard be, and how may it best be incorporated with the other requirements? This is not for me to answer. It is a problem, and its solution will require the united wisdom of the members of this association. By way of suggestion, however, I would offer the following: 1. The student should be assigned a desk or bench in the laboratory, furnished with the necessary tools and material, and be given an appliance or device which he is to reproduce as accurately as possible. 2. The task assigned should be such as to preclude the probability of his having done work of exactly similar character before, so as to guard against mere automatic repetition. 3. The ordinary laboratory processes, involving no special skill, such as repairs or additions to vulcanite plates, should be excluded. 4. In case where the candidate has had no experience in the use of some of our special tools or processes, such as soldering, swaging, etc., the test should be simple in character, and might consist in requiring him to reproduce from a block of wood, by means of saw, file

and penknife, some geometrical form, as a cube, pyramid or rhomb. 5. In cases where the applicant has had some laboratory instruction or practice before coming to college, the test should be a little more severe in character. Inasmuch as regulating appliances are so varied in character, and often combine a number of different manipulations in their construction, such as filing, bending, soldering, etc., the construction of one of unusual design would probably furnish the best all-around test of ability. 6. During the test the student should be isolated until the task is completed. A competent demonstrator should watch the progress of the work from time to time, so as to form an opinion of the candidate's handiness with tools, but should offer no aid, even in the way of suggestion.

JUDGMENT, MERCENARY SPIRIT, AND RESULTS.

By Grafton Munroe, D.D.S., Springfield, Ill. Read Before First District Dental Society of Illinois, at Monmouth, Sept. 27–28, 1898.

The daily occurrences in the practice of dentistry often dwarf our judgment so that the mercenary spirit all but asserts itself, and we are reduced to devotees of that god typified by the "I promise to pay the bearer" the sum required after our labors are over. See then to it that we seek diligently to so guide our judgment that our patients may be free to know and believe we are practitioners whose results prove us to be doctors and teachers instead of graspers.

The old maxim that honesty is the best policy cannot be better applied than in the giving of an opinion as to what should be done in individual cases. "An honest dentist" is a good title for anyone, and he who would do for others as he would be done by will surely hope that such may be his epitaph and that hosts will rise up and call him blessed.

The scope of our advancing profession is so wide that it is fast becoming sciences within a science, and specialties of dentistry are an assured fact. In our large cities the administration of anesthetics, irregularities and correction of same, and prosthesis, are all practiced as separate branches. With these in view it is easily understood how hard it is for the general practitioner to formulate his judgment into advice that can be considered good, and thus obtain the most desired results.

On many occasions we feel inclined to use gold fillings, where we

should use only amalgam or cement. Gold cannot be called the best filling, for although we are so often asked this question, it should be answered by, "It depends upon the conditions of the mouth." The use of gold is most remunerative and ordinarily looks better, but its durability under certain conditions is so questionable that for one to use it in a large percentage of cases is only the result of perverted judgment, and the cropping out of that spirit which fills the pocket of the operator regardless of results. Often teeth are sacrificed and simple cavities converted into exposed pulps, then gold crowns are required.

Would that it were possible for the reputable practitioners to use their positions as teachers, for such is the meaning of "doctor," to educate the people in some way. The time is fast approaching when children will be required to have their mouths examined upon entering school, just as vaccination is now required. Could not this and other societies help matters by publishing pamphlets for public distribution, which should be ethical and give the multitudes the benefit of proper advice regarding the dental organs.

While I would not assert that all prominent gold crowns are out of place, for cases occur where there is no other method of procedure, they are usually an ear-mark of the methods of many slipshod operators.

Bridge-work has helped thousands of people, and at the same time has been the means of robbing many who were the victims of unconscientous practitioners. Inserted upon teeth unfit to carry such work, or in mouths of neglected people, or upon abutments insufficient for the load, it has brought an odium upon this class of work which must be wiped out.

Oxyphosphate is often placed in teeth fully equal to carrying gold fillings, and this is only the result of incompetence, thus proving that the latter cannot exercise good judgment.

Empiricism in the treatment of roots of teeth, whether diseased or not, is not good judgment. Idiosyncracies or chronic nature of the cases are much better guides. Could we reach that goal where the application of one certain medicine for all cases of abscess would be the sovereign remedy, our judgment would fall into disuse and diagnosis would count for naught.

The conservation of the pulp comes in for consideration as one of the instances where judgment is brought into active play, and often

the dentist is led to stretch his imagination, where it would have been better to stretch the nerve.

The practice by the prudent and wise practitioner of keeping records of each and every dental operation is fruitful of much good. As a means of identification under legal and other circumstances their value cannot be minimized. Shrewd indeed was the official who called into requisition the dental records of the unfortunate women incinerated at the Paris Bazar fire. The wrath of some unreasonable patron, who thinks dental work should prevent all further decay, can be abated frequently when it is proven to his satisfaction that "the loose filling" is not your work. Records are necessary however.

The judgment of the writer would indeed be short-sighted did he neglect to emphasize the beneficial results accruing from dental meetings. There is no better avenue for the spending of money earned at the chair than to use it in attendance upon conventions. The benefit is not selfish, as the patients will receive better service, and the dentist owes it to them to forget the mercenary spirit which would prompt him to stay at home and save the money. Contact with other men will broaden any practitioner whose judgment is not perverted by a feeling of self-sufficiency.

In conclusion, let us be mindful of that Association which will protect us against the demands of unreasonable manufacturers, and would-be vendors of licenses, and use our judgment by binding ourselves together against exactions that would thwart our usefulness.

INCREASE OF CANCER.—In 1840 the proportion of deaths from cancer to the total number of deaths was 1 in 129, while in 1896 it amounted to 1 in 22. Mere increase of population will not account for this continuously progressive augmentation of the cancer death-rate, and it cannot be ascribed to improved diagnosis or other casual error. Moreover, I have ascertained that the increase has not been confined to one or a few parts of the body, but that it has involved them all—on the whole without any considerable disturbance of the normal proportionate localization ratios. The cancer mortality for males from 1851 to 1890 has increased 167 per cent; the increase for females has been but 91 per cent. It seems to me probable that this undue incidence of the increasing cancer mortality in males may be ascribed to the fact that of late, as the result of urbanization, the conditions of life for men have come to resemble more closely those for women than heretofore. Excess of food with want of proper exercise and changed surroundings are, I think, its chief causative agents.—*Mr. Roger Williams, England.*

Digests.

THOUGHTLESS MOTHERS. By Claude C. Chick, M.D., D.D.S., Grand Rapids, Mich. I am sorry to say that mothers are very thoughtless concerning their teeth; also as regards the masticating of food for the good of their infant children. We hear many mothers exclaim that their child has such a bad stomach, and the doctor does not seem to know what is the trouble and so gives the child no relief. If the physician would examine teeth of mother he might get a pointer as to the cause of trouble. Some mothers masticate part of the food and give it to the babe to swallow, and to be digested by its little tender stomach. When the mother has several bad teeth broken down by decay, etc., it is very common for her to have pyorrhea, at least her mouth is in a bad state, even for the general health of the mother, leave alone the health of the delicate little child.

When a physician is called to attend the child he generally asks what it has been eating, and the mother frequently states, "I gave it milk, potatoes, bread, meat, etc." But also says, "I can't see how the meat could affect the child, as I chewed the meat all up fine before giving it to him to eat." When a physician meets such cases, if he would refer mother to family dentist it would improve the health of both mother and child.—*Indiana Journal, Jan. 1899.*

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CASE OF OSTEOMYELITIS OF THE INFERIOR MAXILLA WITH SEPTICÆMIA FOLLOWING PERIALVEOLAR ABSCESS—RESECTION OF ONE-HALF OF THE INFERIOR MAXILLA—RECOVERY. By Moses S. Kakels, M.D., New York. A boy five years of age was seen by me on the evening of December 22, 1897. He had been ill then about a week, suffering from a toothache and swollen face. On examination I found a well-marked case of perialveolar abscess, pointing toward the mouth and also slightly bulging under the jaw. The temperature was 103° F. The next day I made a large and free incision on the inside of the cheek and evacuated a quantity of foul-smelling pus. A wick of iodoform gauze was inserted and a mouth-wash of permanganate of potassium ordered. Twenty-four hours later, instead of being better the patient's condition grew worse. The teeth over the focus

of infection were extracted in order to secure freer drainage. Notwithstanding these procedures, with preceding chills his temperature rose to 106° F., with correspondingly high pulse. The cheek was incised from without to secure a wider and more dependent opening. There was no doubt that I had to deal with an intense septic condition due to an acute osteomyelitis of inferior maxilla.

Accordingly on Dec. 25th under narcosis a larger incision was made, extending from the angle of the jaw to the symphysis menti down through the periosteum to the bone. The diseased tissue was scraped out and drainage tubes and gauze were inserted. The wound was irrigated daily with peroxid of hydrogen and permanganate of potassium. In spite of these active and thorough measures the patient did not improve, but on the contrary aggravated symptoms of sepsis continued. Chills followed by a rise of temperature on several occasions as high as 107° F., with sudden drop to 99° F., repeatedly occurred.

The prognosis looked dubious. The question now arose whether an exsection of this portion of the jaw, which was the centre of microbic infection, was indicated. Daily examinations revealed no signs of metastatic infection in any other parts of the body. I could not but think that this was the proper thing to do, notwithstanding the high temperature and rapid pulse. But one must take into consideration that an immediate exsection in such a condition would open new portals for the entrance of infectious material, and with our present means of treating purulent infiltrations, perhaps with conservatism, nature would in her efforts throw out barriers against further septic absorption. Consequently I decided to treat the patient on this expectant plan.

With this decision the patient was fed on whisky and milk and the wound was treated antiseptically by daily irrigations. The patient hovered between life and death for several weeks. The temperature was always high, between 103° and 106° F., with rapid pulse. With careful nursing he gradually grew stronger, so that on March 26 under chloroform narcosis I was able to remove the sequestrum, which consisted of the entire right half of the lower jaw-bone. As soon as the necrosed bone was extracted the support on this side was removed, and consequently the muscles on the left side contracted and drew the remaining portion of the jaw to the back and left side, leaving a great and marked deformity. To over-

come this I had a dentist make an impression and construct after my plan a mechanical support, consisting of an intradental splint made of gutta-percha, which was anchored up against the upper jaw and remaining half of the lower jaw by silk sutures through openings drilled in the mold and ligated to the teeth. It was so made that there was room for liquid food to pass into the mouth without having to remove the splint. This was left in two weeks at a time, taken out, cleansed and reinserted until the involucrum was sufficiently firm to hold the jaw in place of its own accord. The wound gradually closed and the boy made a perfect recovery with a normal-looking face, except the scar from incision, and deformity was entirely corrected. Conservatism in this case was a wiser procedure than radical measures would have been. An interesting feature is the recovery from an intense sepsis, due to the osteomyelitis, lasting several weeks, without complications in other organs of the body. The use of the gutta-percha splint in overcoming the marked deformity answered the purpose perfectly.—*Medical Record, Feb. 11, 1899.*

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SURGICAL ANATOMY OF ALVEOLO-DENTAL ABSCESS OPENING INTO THE ANTERIOR NARES. By Henry H. Burchard, D.D.S., M.D., Philadelphia. Cases of chronic alveolo-dental abscess upon central incisor teeth, which vent themselves into the anterior nares and cause a discharge from *one* nostril, simulating that of ozena, are not rare. The cause assigned for the peculiar situation of discharge is undoubtedly the correct one in many or most instances—viz., the alveolar process is unusually short in some persons and the apices of the roots of central incisors lie unusually close to the nasal floor; in cases of abscess the cancellated bone intervening between root apex and nasal floor offers less resistance to the progress of suppuration than does the outer alveolar wall labially.

A study of the sectional anatomy of these parts reveals another probable cause for this and other peculiar situations of discharge. An examination of superior maxillary bones which have been drawn away from their bony attachments shows immediately behind the central incisor teeth, and close to them, a series of foramina which transmit the anterior palatine and naso-palatine nerves, which pass forward along the right and left palatal processes from the posterior dental canals lying deep in the mucoperiosteum of the

palatal processes. These nerves entering the foramina are at least four in number, sometimes more. An examination of the nasal floor will show that these nerves enter that cavity by apparently four foramina. If a section be made (longitudinal) of the palatal process to one side of the median line, it will be observed that these foramina are openings surrounded by soft, not bony, tissues, and that what are called the anterior palatine canals may be a considerable fossa, lined by a continuation of the periosteum of the nose from above and by a continuation of the maxillary periosteum from beneath. The fossa or canal is continuous across the median line.

This canal lies parallel with the roots of the central incisor teeth, separated from them in a greater or less portion of its length by a comparatively thin layer of bone. It is therefore quite probable that an abscess upon the root of either incisor might find discharge into the canals, and ultimately upon the floor of the anterior nares. As the fossa is one without division into right and left halves, abscess upon an incisor of one side might vent in the nares of the opposite side.

The pus in cases having these anatomical relationships might pursue the opposite course and find exit at the lower end of the fossa, discharging as abscess upon the central incisor occasionally does immediately behind the incisor teeth. Failing immediate discharge, the pus might dissect along the fibrous tissue of the palatal vault. It would be interesting to note in such cases, particularly those of long standing, whether any evidences of injury to the nerves contained in the canal arise. A trophic function has been assigned these nerves. At any rate it is certain that they contain vasomotor fibers to the vessels of the anterior nares. Evidence of their injury would probably be localized atrophic rhinitis in the anterior nares.—*Dental Cosmos, Dec. 1898.*

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EXPERIMENTAL RESEARCHES AND EXPERIENCES CONCERNING INFILTRATION ANESTHESIA. By Dr. H. Braun, Leipzig. Reported before the German Surgical Society. This very exhaustive investigation begins with a consideration of the general principles of local anesthesia, of which the author distinguishes three separate kinds. It may be purely mechanical, as in the infiltration anesthesia of Dr. Schleich; or it may be partly mechanical and partly due to the paralyzing influence of the mate-

rial employed, as in the direct infiltration anesthesia proposed by Professor Reclus; or finally, it may be a true regional anesthesia, due to the specific action of the agent used upon the terminal nerve filaments. The author has experimented with the most varied pharmaceutical and chemical agents in different concentrations; of especial interest, however, are the results that he obtained with the chemical substances specifically known as local anesthetics, in which the paralyzing action upon the nerve filaments greatly exceeds the irritant effect, or in which the latter is absent altogether. With these substances the author took especial pains to ascertain the minimum amounts that would neutralize pain of swelling caused by the injection, and the minimum limit of efficacy of the remedy.

In the course of these experiments a number of the more recently proposed local anesthetics were investigated, including guaiacol, guaiaryl, aneson, orthoform and eucain "A." The author found most of them more or less irritating, and unsuitable for the infiltration anesthesia at all events; more especially guaiacol, which was intensely irritating and insoluble in water. Eucain "A" was the only one that effected a practically useful regional anesthesia, but the author does not think that it is equal to very dilute cocain solutions either in its local anesthetic effect or in the absence of irritation.

The author did not employ morphin, as recommended by Dr. Schleich, because all solutions of the drug in water or the physiological salt solution, even in the greatest dilutions, have a peculiar local action upon the blood-vessels. This is a specific effect of the nature of a paralysis of the vessels in the neighborhood of the site of injection, and is shown by the hyperemic zone that surrounds it; the exudation of fluid from them. Besides this, there is always with morphin a depression of the general sensibility, even when very minute amounts of the drug are employed. Morphin itself is anything but a local anesthetic.

The author then investigated cocain, the lower limit of effective action of which he found to be at 0.005 per cent (1:20,000), and finally proceeded to beta-eucain, a substance closely related to it. In agreement with Heinze's conclusions, of the absolute equality of beta-eucain and cocain in their anesthetic action when used by the infiltration method, Braun states that his cocain table applies to the newer drug word for word. The limits of its effective action is 0.005 per cent; like cocain the addition of 0.04 per cent of the drug

masks the pain of the injection; and equal percentage solutions of both drugs have the same freezing point. Even 10 per cent solutions cause no more pain than cocain; the intensity and duration of the infiltration anesthesia is the same for solutions of both drugs of equal percentages; only the spread of the anesthesia beyond the limits of the directly infiltrated zone was slightly slower with a 1 per cent beta-eucain solution. "There can therefore be no doubt," the author says, "that cocain and beta-eucain are the only two substances to be considered in the selection of a drug for infiltration anesthesia; they alone paralyze without irritation and injury to the tissues, and they alone effect an anesthesia lasting enough for practical purposes even in extreme dilution. Of the advantages of beta-eucain over cocain and of the toxicities of the two drugs I shall have something to say later."

In a note the author says that tropacocain has some advantages over cocain in regard to the permanence of its solutions and the possibility of sterilizing them; but that it has the disadvantages as compared with beta-eucain of lesser local anesthetic power, greater toxicity and irritation. The author continues: "We found that as a substitute for cocain for the production of a direct infiltration anesthesia beta-eucain only, which is absolutely equal to it in value, deserves consideration. But it is not merely a possible substitute for cocain; it is absolutely to be preferred because less poisonous and less specifically irritant, and also because its solutions are permanent and can be boiled as often as is necessary."

The author recommends the following solution for infiltration anesthesia: Beta-eucain, 1.0 grm. (15 grains); salt, 8.0 grms. (120 grains); distilled water, 1,000.0 grms. (32½ ounces). Its freezing point is 0.535 degrees C. It is osmotically almost indifferent, and in all tissues accessible for direct infiltration it causes an anesthesia without irritant effects, lasting from ten minutes to an hour or more.

"I have experimented with the practical usefulness of the 0.1 per cent osmotically indifferent beta-eucain solution for months past in a large number of clinical and polyclinical operations. As a rule we used only this one solution. For it was not to be expected that toxic symptoms would be encountered when using a 1 pro mille solution." Dr. Braun has twice used almost 300 cubic centimeters (10 ounces) of the above solution, once for the extirpation of a large

lymph-gland tumor of the neck, and once for a radical operation for hernia at one sitting. More will hardly ever be necessary; yet a dangerous dose was not even approached, for the same amount of a 1 per cent beta-eucain solution can be injected subcutaneously into a rabbit, absolutely inflating the animal with fluid, without in any way hurting it. And since large amounts of the osmotically indifferent fluid can be given by intravenous injection to animals without damage, such an occurrence accidentally to human beings would do no harm. Of beta-eucain 0.3 gram (4½ grains) in 10 per cent solution causes in rabbits a mild and evanescent intoxication; the same amount of cocain in similar concentration kills the animal in a few minutes. As Vinci has demonstrated, beta-eucain is very much less dangerous than cocain; it seems to be free from all by-effects, and to exert only a paralyzing action. Concentrated solutions, however, should be as carefully employed as similar ones of cocain or any other substance which acts as a local paralyzer in great dilutions. Five to ten per cent beta-eucain solutions injected into the tissues cannot fail occasionally to have undesirable and ill effects, since like the others they may occasionally reach the central nervous organs but little diluted. Used in the right way beta-eucain is an ideal and safe drug for infiltration anesthesia.

"The necessity of diminishing the percentage of beta-eucain in the solution will hardly ever occur; but of course it may be so diminished to 0.05 per cent or even to 0.01 per cent, for the infiltration of less sensitive tissues that are to be anesthetized only for a short time. An increase of the percentage over 0.1 per cent, granted that a direct infiltration of the tissues is possible at all, will be required only in those rare cases in which greatly inflamed and hyperemic tissues are to be anesthetized for a longer time than is possible with the standard solution; as when other procedures than simple, rapidly made incisions are required. In such cases I have always attained my object by an abundant and extensive infiltration of the tissues with the 0.1 per cent solution." "I have never seen any interference with the normal course of the resultant wounds when boiled solutions were employed."

"As already mentioned, the spread of the anesthesia beyond the directly infiltrated tissues is a little slower than with cocain, and it is also a little slower in penetrating the nervous twigs. As the specific action of both drugs is absolutely equivalent, these differences

must depend upon physical causes, such as differences of diffusibility and of endosmotic equivalent; factors which evidently play a very small part, or none at all, in direct infiltration anesthesia."

For the last six months the author has employed the osmotically indifferent 0.1 per cent beta-eucain solutions exclusively in minor surgical operations of all kinds. He does not doubt the possibility, however, of doing the largest operations, such as the major amputations, under the infiltration anesthesia, possibly with the help of a short general narcosis; thus saving the lives of patients who could not stand a prolonged anesthesia.

He then mentions the fact to which Reclus first called attention, that cocain anesthesia rapidly disappears under the influence of incandescent heat, which destroys the drug. The same occurs with eucain anesthesia. Thus in hemorrhoidal operations with the thermo-cautery, the anal dilatation may show complete insensibility of the parts, and yet the anesthetic effect disappear when the cautery is used. Excisions of hemorrhoidal tumors, which certainly take a longer time, and all other uncomplicated operations upon the rectum, can be done admirably under the infiltration anesthesia; in fact insensibility lasts much longer than is necessary.

For the opening of sharply limited acute and chronic abscesses the Schleich infiltration method with osmotically indifferent, warmed cocain or beta-eucain solutions is an excellent method. Schleich's original solutions with cocain are often too painful in these cases; and if they are boiled, as is frequently recommended, they cannot possibly give satisfactory results.

Finally, the ½ per cent to 1 per cent cocain or 1 per cent beta-eucain solution is far preferable to infiltration anesthesia for the production of regional anesthesia by interrupting the conductivity of the nerve trunks of the fingers and toes, as long practiced in the Volkmann Clinic. For this purpose it is the ideal and practically important method. Just how far it can compete with the infiltration anesthesia in other parts of the body is as yet undecided. Of course both solutions require an addition of cooking salt of at least 0.6 per cent. The author's experiments in this direction are not yet concluded.

It is true that in certain cases of limited operative procedure a direct infiltration anesthesia with small quantities of more concentrated cocain or beta-eucain solutions possesses manifest advantages

over the tense filling up of the tissues with larger quantities of more dilute solutions. But in ordinary cases there is no reason for using concentrated solutions of an anesthetic when dilute solutions give excellent results. In any case it is proper not to exceed the maximum dose of 0.1 gram (1½ grains) of beta-eucain; in very dilute solutions (1:1000) doses of 0.3 gram (4½ grains) will do no harm.

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SOME OLD AND NEW VIEWS OF CALCIFICATION OF THE TEETH. By F. J. Bennett, M.R.C.S., L.D.S. Eng. Read before Odontological Society of Great Britain. It is just forty years since George Rainey published his treatise on "The Mode of Formation of Shells of Animals, of Bones, etc., by Molecular Coalescence," and to about that period belongs the quite independent investigations of Professor Harting, of Utrecht. As most of our ideas of the mode of deposit of lime-salts in the teeth have been largely influenced by these researches, I think it right to briefly describe some essential points on which their conclusions were based.

Briefly stated, these observers considered they were able to reproduce artificially certain of the calcareous structures found in the animal kingdom, such as shells, spines, etc., and according to Rainey, bones and teeth. And further, that the form in which the lime-salts were found in these tissues was largely due to the colloid solution in which they were deposited. Their experiments consisted essentially in causing the salts of lime to be formed in the presence of a viscid medium, and of combining with this while in a nascent state. The substances employed by Harting were either calcium chlorid, calcium nitrate, or calcium acetate, uniting in the solution with either sodium bicarbonate, sodium phosphate, or ammonium phosphate. The colloid fluid being albumen or gelatin, Rainey's chief experiments were made with gum-arabic in solution, which was allowed to mix slowly with another solution of the gum containing potassium carbonate, the calcium which exists in the gum-arabic uniting with the carbonate from the potash to form calcium carbonate. After resting for some weeks it was found on microscopical examination that the natural shape of the crystals of carbonate of lime no longer existed, that the form was that of granules or spherites or globules, free or coalescing. Rainey found in the union of these globules an exact resemblance to the youngest layers of the shell of crustaceans and to the recently formed bone of

certain fishes, and concluded that a similar mode of formation existed, the globules by a mutual fusion forming into laminæ. He further considered the artificial globules explained the nature of interglobular dentin.

So far as these experiments refer to the formation of shells I have nothing to say against the theory, but when it is applied to a consideration of the teeth and bones it is open to some grave objections, the chief of which is revealed by a study of the percentage composition of enamel, dentin and bone. We find in a hundred parts of enamel—calcium phosphate, 89.82 per cent; calcium carbonate, 4.38 per cent. In a hundred parts of dentin—calcium phosphate, 66.7 per cent; calcium carbonate, 3.36 per cent.

Side by side with this analysis let me quote from one of Prof. Harting's experiments: "When calcium phosphate is liberated by the double decomposition of calcium chlorid and neutral sodium phosphate. The case is quite different if calcium carbonate is at the same time produced in the liquid. The precipitate then consists of a combination of the organic matter with the two calcareous salts. If calcium phosphate exists in large quantity, then the precipitate remains even after several weeks in the amorphous or colloid state, neither crystals nor calcospherites are formed; but if on the other hand the calcium phosphate constitutes nothing more than a small fraction of the precipitate, calcospherites are formed, but among them are some which are the starting place of various ulterior formations." These he reduces to two fundamental forms, either plates, or scales or spines.

It is perfectly clear from these remarks that phosphate of lime formed in a colloid in anything approaching the proportions of bone, dentin or enamel would be quite incapable of assuming anything like the form of calcospherites; indeed, Harting strictly limited the term "calcospherite" to carbonate of lime in a colloid medium, or with only a trace of the phosphate, and it was intended by him to apply to shells and the like. Other forms, as we have seen, are produced by the addition of phosphate, but not the globular or spherite form. Dr. Ord, whose subsequent experiments much extended our knowledge of the behavior of lime salts in colloid media, fully bears out Harting's view on this point.

As bearing on this question, the most valuable of Dr. Ord's experiments was that in which he caused the lime salts to be depos-

ited in coagulated albumen in the exact proportions found in bone, at various temperatures, ranging from 70 degrees F. In all the bone-salt experiments a uniform result appeared at all temperatures. The carbonate was "subduced," as he called it, by the phosphate, and an even, continuous deposit was produced in which no spheres could be seen. He says again:—In warmth and cold alike phosphate of lime when used alone was evenly distributed in definite strata, not forming crystals, but cementing the albumen to great hardness." In short, we may say Dr. Ord had in these experiments very fairly imitated the deposit such as forms the matrix of dentin or bone.

From a study of their works, it is quite evident that nothing resembling the globules of interglobular dentin were produced by either of the three observers when using substances producing phosphate of lime in any quantity approaching that existing in dentin or enamel: and therefore, if we still cling to the idea that interglobular dentin is allied to Rainey's globules or Harting's calcospherites, we can do so only on the assumption that this defectively formed area of dentin consists chiefly of carbonate, not phosphate of lime, but there is no direct evidence of this. And Rainey, who was the great advocate of dentin being formed on the globular principle, has to fall back on vague comparisons, such as "the globular particles of carbonate of lime in shell are doubtless analogous to the globular dentin in teeth." And when he comes to deal with phosphates he seems, for the time at any rate, to realize his difficulty. Thus he says, "Magnesium carbonate does not become globular in gum-arabic, and it is this part of the triple phosphate which prevents the globular form;" but in admitting this, it negatives the idea of globules in dentin also.

In fact, his experiments with phosphates do not tell in his favor as an investigator. For instance, he was mistaken in supposing phosphate of lime to be an ingredient of gum-arabic, for it is carbonate, not phosphate of lime which the ash of gum-arabic yields, so that the globules in the gum were due to carbonate, not to phosphate of lime, as he supposed.

In the other experiment which Rainey records he added phosphate to the gum-arabic, and says—"If there be an excess of triple phosphate in the gum the calculi will be studded with crystals." But we may rightly interpret this by saying the carbonate in the gum-

arabic formed the globules and the phosphate remained unaltered as crystal. I therefore think Harting with justice remarks "on the too limited number of Rainey's observations."

Nowhere, far as I know, does direct experiment favor the globular form as a possible arrangement of the lime-salts in the teeth. In certain stages of tooth formation spherical forms appear which are by no means easy to account for; and by inference only, and that a doubtful one, do we connect them with the globules formed by Rainey and Harting, and we do but add to the complexity if our inferences are wrong. In saying this I admit the weight of opinion which still supports the globular theory, and we must bear in mind there is another aspect to the question which Mr. Tomes lays stress upon. It is this: do we really know the proportion of the salts in bone and teeth? He says: "Great discrepancies exist in the amount of carbonates estimated, and this arises from the great practical difficulty in making a quantitative analysis of small portions of carbonic acid in a substance of which only very small quantities are obtainable, sources of error which cannot be eliminated thus creeping in." And he returns to the view of Hoppe Seyler, that the phosphate and the carbonate of bone as it exists in teeth is really a double salt, a combination of three equivalents of calcium phosphate with one of calcium carbonate, analogous to the mineral apatite, in which the flourin or chlorin of apatite is replaced by the radicle CO_3; apatite being $Ca_{10} F_2 (PO_4)_6$; the double salt of phosphate and carbonate of lime being $Ca_{10} CO_3 (PO_4)_6$.

In some such way either the quantity or the power of the carbonate, so it is assumed by Mr. Tomes, would be increased to that degree as to be capable of yielding the globules even in the presence of phosphates. He remarks also "that dentin of many mammals is much more rich in magnesium phosphate than human dentin, and even in the latter it is various in composition;" and as I have pointed out, it was the magnesium that Rainey found an obstacle in forming globules in phosphate of lime solutions.

As though to celebrate this fourth decade of Rainey's theories, there has lately been almost a "boom" in calcospherites. Mr. Tomes finds in them an explanation of the round bodies in commencing dentin formation. Mr. Leon Williams describes rounded and disk-shaped bodies in forming enamel, and speaks of calcospherites which by melting together produce the larger masses of calcoglobin. This

seems a confusion of terms, for the latter substance, according to Harting, was the altered form of albumen after the lime-salts had been removed. Dr. Andrews of America and Mr. Underwood also find calcospherites in enamel.

But there would still have to be considered the very difficult question as to how it was calcospherites did not more often form in other albuminous constituents of the body, in the salivary glands, in atheromatous patches and in calcifying tuberculous nodules; and in regard to the deposition of the lime salts in whatever pattern, on the principle adopted by Harting or Dr. Ord, we have still a difficulty in assuming that calcium chlorid or the like exists free in the blood or tissues, an almost impossible question to settle. But this aspect of the question leads me to dwell for a few moments on the views of Dr. Sims Woodhead as to bone formation, in a paper read before this Society in 1892. After an examination of the processes in which bone is formed and removed in acute and chronic inflammation, which leads to his views on the normal laying-down of the salt, he says:—"In examining this process of calcification in chronic inflammation, we must always bear in mind that we have a mass of active cellular elements with which the blood and lymph are constantly coming in contact; the fluids are the carriers from which the cells obtain their nutrient material: they are the vehicles by which effete matter is removed, and as a matter of fact, it has been found that in the neighborhood of all active cells these fluids differ very markedly in their composition from the general fluids. For example, there is always an increase in the amount of free carbonic acid in the fluid near these cells, and we have a formation of phosphate and carbonate of lime, the latter in comparatively small amount. In the neighborhood of dead membranes, if these salts are removed at once by dialysis, they remain stable and may be deposited at once; but if they are allowed to remain in contact with the phosphoric acid of the blood and the alkalin phosphates, they are redissolved and are again returned to the fluid circulation. As Irvine and I have pointed out elsewhere, this primarily bears on the process of calcification of bone. The osteoblasts lay down a matrix of formed material; the more active the cells within certain limits, the greater the relative amount of matrix. This matrix may be looked upon as inert or dead organic matter, which corresponds to a membrane through which dialysis may take place, or rather

the layers near the two surfaces may be so considered; and as the molecular combinations of the phosphoric acid and lime, and the carbonic acid and lime take place around the osteoblasts (which, as above stated, during their active formative changes give off the carbonic acid to render the lime for the time insoluble), there is a continuous process by dialysis of separation of these lime-salts, which first make their appearance in the centre of the matrix trabeculæ where the two currents meet, as it were ; from this point the classification extends towards the surface. We look upon the formed matrix then (or dead material) as playing the part of a dialysing membrane that serves to separate the lime-salts prepared in its immediate neighborhood by the carbonic-acid-forming cells, this carbonic acid causing a throwing down of phosphate of lime, with a small proportion of lime in which the phosphoric acid is usually replaced by carbonic acid. It should be observed in this connection that the carbonic acid is, when acting on the lime solution, in a nascent condition ; therefore in a much better position to combine with any lime already held by the phosphoric acid."

In this explanation of Dr. Woodhead's it may be that the salts after filtration through the dead membrane are merely deposited in the fibrous basin simply as granular particles in no chemical relation with this basis whatever. In like manner it may be so in the dentin, and Professor Harting's union of lime-salts with albumen in calcoglobulin may have nothing to do with bone or dentin, and this notwithstanding that we are aware of a tough indestructible form resembling it on the border line of dentin calcification. But in reflecting on the powerful influence of carbonic acid in determining calcification, its effect would appear to be something more than merely holding the salts in solution and throwing them down on its removal. It has occurred to my mind whether, after all, the curious union and molecular form of carbonate of lime that Harting found in albumen may not be due to some action of free carbonic acid evolved in the colloid solutions, causing a more intimate blending and modification of both organic and inorganic constituents.

But the extremely physiological aspect of Dr. Woodhead's theory is one we should all bear in mind, and the state of activity of the cell, the function of the osteoblast, and peculiar properties of imperfectly nourished membranes, etc. For we have to learn not only how the lime-salts are deposited, but how they are prevented from

depositing in other parts. For instance, what controls these depositing in the cells of the salivary gland? Does the carbonic acid hold this in check? It also seems to me that Dr. Woodhead's views suggest the clearer understanding of a possible cause of calcified structures in the ovary and other meaningless situations. Forms of degeneration, such as cysts, are common in the ovary, and it is possible that occasionally the degeneration may assume another form, that of the dead membrane with its affinity for lime-salt precipitation.—*Brit. Jour. Dent. Soc., Jan. 1899.*

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PROPHYLAXIS IN DENTISTRY. By D. D. Smith, D.D.S., M.D., Philadelphia. Read before Northeastern Dental Society, Oct. 19, 1898. Is the process of disintegration of human teeth known as decay, which so frequently ends in complete destruction, wholly or in part preventable? Many theories as to the cause or causes of dental caries have been advanced, and many ingenious methods invoked for arresting decay already induced, but nowhere in dental or medical literature is there an attempt to satisfactorily answer this most serious and important question. It confronts the practitioner of medicine and dentistry alike in the mouth of infancy, childhood, youth, adult life, and even down to old age.

Modern medical science, with all its acumen, has thus far seemingly overlooked, as it has totally disregarded, the mouth and teeth as a constant and prolific source of infection in systemic troubles—gastric, intestinal, cancerous, and pulmonary; and dentistry, engrossed in restoring the ravages of decay, has failed even to discuss, much less earnestly investigate, the subject of dental prophylaxis.

Although interested in dentistry for the past thirty-seven years, and directly in the current of its wonderful progress for thirty-two years consecutively, yet the writer must confess to undivided concentration on the same lines of effort which have characterized the work of the profession in general, viz., mechanical restoration for teeth already decayed. Recognition of the utter impotency of the present methods of dentistry to cope with the extensive decay in the human teeth, as seen in the mouths of the suffering masses, has more recently stimulated to investigation and effort in the direction of the title of this paper.

Some startling statistics, also coming to notice, may have had

their promptings as the following: Examinâtion of the mouths of the children of the public schools of the city of Toronto by a dentist, the inspections being systematized and extending over a considerable time, revealed that ninety-two per cent of them were dentally in a pathological state and needing professional attention. A strictly accurate report on the mouths of the children in our public schools and families would, we believe, disclose a pathological condition in excess of that tabulated as existing in Toronto. From unrecorded examinations among the more careful families, extending over a period of years, it is my firm conviction that not three per cent of the children in the average condition in life have mouths and teeth in a strictly sanitary and hygienic state. And what has been said of hygienic and pathological conditions in the mouths of children will apply with equal force to the dental outfit of adults.

With these statements before us let us look briefly at what dentistry is really doing for the community at large, a matter perhaps as well illustrated in our own city of Philadelphia as in any place in the country. This is preeminently a city of homes, and has a population of about one and a quarter millions of people. Its houses, *not tenements*, number, it is said, some thousands more than the great metropolis before the consolidation. It is estimated that only about four hundred thousand of the population receive any benefit at all at the hands of dentistry except the extraction of teeth. Not all of the remaining eight hundred thousand or nine hundred thousand are excluded from the benefits of dentistry through inability; some shut themselves out through fear, others through indifference, and some in inexcusable ignorance fail of benefits at the hands of the dental profession. It is probably within the bounds of a correct estimate to say that one-half of our population are excluded through pecuniary inability.

The God-likeness of medicine is exhibited in its reaching out in one way or another, often without hope of compensation, to relieve suffering in the humblest of humanity. Dentistry, in the nature of things, until state or public bequests shall come to its aid, cannot imitate medicine in this, but we believe it can come to the aid of a suffering race in a most important way and on a grand scale, by presenting methods which are within the reach of the high and the low, for arresting the present rapid destruction of the human teeth. To accomplish anything in this direction there must first be recog-

nition of facts, and then the creation of a literature to make them known.

One of the most recent works on dentistry—"The American Text-Book of Operative Dentistry," is without a chapter or even a sentence, distinctively as such, on this subject. Illuminated with illustrations of instruments, appliances, methods of operating, good and bad, like other works of its kind, it deals largely with the mechanics of dentistry, and nowhere recognizes the more important matter of the prevention of decay in the teeth.

If we except one or two of the more important and really helpful papers, noticeably a letter from Dr. J. L. Williams, and a paper by by Dr. I. N. Carr, it may be said that dental prophylaxis has failed to receive the recognition in the journals or before the societies which its importance demands. The reason why so little interest is manifested in the subject seems obvious. Manufacturers of patent and secret preparations are taking the initiative, and through their wares forcing the matter into notice. Some of the preparations now in use may be made to supplement in a valuable way the intelligent efforts of the dentist in the direction of prophylaxis, but each and all utterly fail, as they always must, to reach and remedy the *cause* of decay. While comprehensive claims for far-reaching effects upon bacteria and occult diseased conditions of mouth and teeth are made for many, they bring little comfort to the true investigator.

In the *Hospital*, a London publication, August 20, 1898, we find the opinion expressed that the modern physician is surfeited and embarrassed with the richness of the materia medica that is constantly poured out upon him by the manufacturing chemist. His experiments with new drugs leave no time for practical experience with diseased conditions. The editor says,—"The present writer has a grievance—a real, determined, angry grievance—against England, Germany, and America. These are the three countries which deluge medicine with physiology, good, bad and indifferent, but mostly bad; which flood it with literature in the shape of medical books, with no soul of either science or practice in them; and which 'evolute' new remedies, not by the score, but by the thousand annually, of which not one in fifty is worth even so much as a second thought. The inevitable effect of all this upon the average minds in the profession is either to suffocate and so to paralyze them with what appears to be new knowledge, or else to so disgust the

practitioner that he makes up his mind never to read at all, and on no earthly consideration whatever to experiment with a new drug. Medicine, in short, is swamped, drowned, stifled and paralyzed by innumerable exploiters within and without its ranks; exploiters whose only object is the shortest possible cut, not to fame and fortune, but to notoriety and pelf. Now all this has an exaggerated sound about it. But, indeed and indeed, however exaggeratedly it sounds, it does not express one-tenth part of the miserable truth. The steady practitioner, whose aim is to supply his patients with the very best resources which the science of the times can afford, finds that about half his busy hours are spent in the brain-wearing, and what should be quite unnecessary, operation of separating the precious from the vile." This seems as applicable to the conditions existing in dentistry as in medicine.

The cause or causes of decay in human teeth may be and are complex and often difficult to satisfactorily explain; but one fact is established in the minds of all true observers, viz., that decay of the human teeth results from the erosive or chemical action of external agents. Whether decay be regarded as chemico-vital (old theory), chemico-parasitical (Miller), a chemical change produced by minute organisms in the fermentable matter lodged upon and between the teeth (Carr), or whether it is due solely to bacteria and their products, *all act from and upon the surface of the teeth.*

When Professor McQuillen demonstrated the existence of what he called interglobular spaces [Czermak, 1850, was the first to describe "interglobular spaces." Tomes (Sir John), 1859, called these "areola dentin."—*Ed. International.*], under the enamel and in the dentin of some teeth, it was for a time inferred that decay might in some instances have its beginning within the tooth, in the dentin. But when it was shown that these so-called interglobular spaces were imperfectly calcified, and not decalcified dentin, the theory of internal decay lost its only support, and it now has but few advocates. All tooth-decay begins at and advances from the exposed surfaces of the teeth, and the work of decalcification moves forward on the line of the tubules just in proportion as the chemical forces acting externally are able to neutralize the vital force which has bound and holds the enamel and dentin as tooth-structure. The resistance which the tooth interposes to decay-producing agents is wholly from two sources—1st, the composition, make-up, or

vital density of its surface; 2d, the influence of the living pulp in an endeavor to maintain the integrity of the tooth. Pulp-action in some cases is so vigorous and energetic in opposing the encroachments of decay that new and denser material is deposited not only in the substance of the dentin, but in the pulp-cavity as well. This, however, is the marked exception, and by no means the rule. Pulp-tissue in general, acting for the conservation of the tooth, opposes but feeble resistance to the chemical forces in contact with the surfaces of the teeth. Decay of the teeth, then, may be regarded as a battle between chemical agents and the vitally organized tooth-structure, the strength and activity of the contest depending upon the affinity of the chemical for the elements comprising the tooth and the resistance offered by the consolidated tooth material.

This is strictly accurate in its application to the crowns of devitalized teeth. In teeth with living pulps the chemical action is modified only as the vital force in the tooth tends to retard resolution. This being true, it is plain that a tooth will be wholly preserved from decay if protected on its exposed surfaces from all chemical action. Cover the crown of a tooth with a gold cap, for instance, embedded in one of the phosphate cements, and the tooth will be freed from all liability to decay, although it has been shown that the phosphate cements are not bacteria-proof. Silver nitrate is advocated as a barrier to the progress of decay; its action, like that of the phosphates, is to mechanically protect the surfaces to which it is applied. How, then, shall we relieve all teeth from liability to decay? Obviously by preventing the permanent lodgment of decay-producing agents, whether they be acids, alkalies, or bacteria, singly or in combination, upon the exposed surfaces of the tooth; in other words, by giving tooth-tissue destroyers no time to chemically break up the vital combinations existing in enamel and dentin, and resolve their elements into new chemical compounds.

If we consider the condition of decay first encountered, generally induced and fostered by the dark-greenish deposit at the cervical margins, especially of the front teeth in the mouths of children, appearing frequently at two years of age, and continuing on to the age of fifteen and even later, we find these mouths veritable crucibles, having in them a mixture of decaying foods, foul odors, natural and artificial acids, bacteria and heat. It can be no mystery that nature's best endeavors are thwarted amidst such surroundings.

What prophylactic treatment shall be instituted and maintained in these and less marked cases? Dr. Williams says, "I have repeatedly pointed out that in my judgment the greatest hope for the future in the saving of human teeth lies in the direction of prevention of decay *by the use of germicides.* [The italics are mine.] In my own practice I have relied chiefly upon a strong solution of hydronaphtol in oil of cassia. . . . This I use freely in all cavities, and then before filling I use a varnish of Canada balsam in chloroform in which there is ten per cent of hydronaphtol. My patients use a dentifrice in which hydronaphtol and oil of cassia are the principal germicides. Decay in many instances has been almost entirely arrested. I am, I believe, speaking with all due caution when I say that in my judgment two-thirds of the decay of teeth now going on is preventable."

Whatever of good there may be in these suggestions, they fall far, very far short of meeting the requirements of true dental prophylaxis. Permit an extract from the paper of Dr. Carr: "Another established fact is that decay of the teeth is due to external causes. The process of destruction is from without inward. . . . Now, then, conceding the fact that the chief cause of caries is the presence of bacteria, it becomes at once our highest duty to apply some remedy for freeing the oral cavity of those destructive organisms, realizing that in a scientifically clean mouth there can be no caries." After setting forth these facts Dr. Carr attempts a discussion of the irrelevant matter of foods for patients, arriving at the conclusion that "it appears to be out of the question to regulate the diet of our patients, except in case of infants and children whom we can control."

I have made this latter quotation to give emphasis to the erroneousness of this and similar sentiments which crop out from time to time. The proposition that the dental profession in its present standing, deficient in medical training and lacking in influence, can or should assume to "control the diet of infants and children," trenches on the borders of absurdity, and panders to that spirit of self-adulation already over-cultivated. Had we the power, it would become us to give to every mother and every child a plentiful supply of healthful food, consisting of cereals, vegetable, nuts, fruits and meats, and thus and thus only, through diet, lay the foundation for good teeth. No special feeding is demanded for the teeth, neither will such feeding be tolerated by the general system. Foods

that will make good bone, muscle and nerve-tissue are equally good for the proper building of teeth.

It is much more commonly want of vigorous, healthful circulation in the tooth than lack of food-supply which gives rise to poor tooth-structure. Teeth require use, exercise, stimulation, and more than all, they require to be kept free from the paralyzing effects of external deposits. Dr. Carr says truly that "in a scientifically clean mouth there can be no decay." To effect this requires something more than germicidal washes, soaps, dentifrices, or even the so-called prophylactic brushes. Frequent friction and vigorous polishing on all crown surfaces will alone accomplish it. This polishing is best effected with a stick, as orange-wood, and a suitable grit, as fine pumice. Cleansing by such means insures removal of all injurious matter from the surfaces, compels change of environment, stimulates free and healthful circulation within the tooth, and induces the deposit of vitally organized, decay-resisting matter for enamel and dentin. The stimulation resulting from regular and persistent stick-polishing is entirely different from that cleansing which attends the ordinary use of dentifrice and brush.

None of the means commonly employed by patients, as the brush and dentifrices, dental floss and washes, implies *cleanliness* for the teeth, much less freedom from decay; but a regular system of surface-polishing with stick and grit gives positive cleanliness, effecting as it does the absolute removal of all deposits,—solids, semi-solids, viscid fluids and bacteria, thus placing the tooth in the best possible condition to resist decay. The importance of this method of cleansing and stimulation in the mouths of children, commencing with the deciduous teeth at about two years of age, can scarcely be overestimated. It should be continued at intervals of about a week during the period of the temporary teeth, and maintained with equal regularity after the eruption of the permanent ones, gradually extending the time for cleansing to periods of three or four weeks on to adult life. The results from this treatment have proved uniformly beneficial.

Mothers taught the importance of caring for the teeth of children and instructed in this method may be armed with a good porte-polisher, orange-wood and levigated pumice, and have the preservation of their children's teeth in their own keeping. Since the introduction of the multiplicity of felt and rubber wheels and disks for

polishing with power, the hand porte-polishers have fallen into disuse, and none worthy the name are now to be found at the dental depots. A slight modification of the "Jack" porte-polisher, readily obtainable, would meet all requirements in this direction. Power polishers, whilst justly accorded a place for polishing metallic fillings, are not adapted for reaching the surfaces of many teeth most needing attention, and they are contraindicated in the mouths of children. Stimulation of pulp-tissue, resulting in improved tooth-structure, is a noticeable and most beneficial result of the process of hand-polishing herein described.—*International, Jan. 1899.*

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REFLEX ACTION OF THE FIFTH NERVE. By Walter F. Lewis, D.D.S., Oakland. Read before Pacific Coast Dental Congress, Portland, Ore., August, 1898. Facial neuralgia in the distribution of the trigeminal nerve is one of the most frequent neuroses. The symptoms of facial neuralgia consist of pain which is either constant, or more frequently comes in paroxysms of varying intensity. The pain is usually confined to a single branch of the fifth nerve, but may be present over the entire region affected by it. The pain sometimes radiates into other nerve tracts, and is not infrequently combined with clonic spasms of the motor nerves, especially the branches of the facial. The paroxysms of pain are often called forth by the slightest irritation, such as touch, pressure, a draft of air, mastication, emotion, etc. The duration and intensity of the attacks of pain are variable. The patient is usually an object of commiseration. The ordinary activities of life are sadly disarranged, and if the malady continues for any length of time nutrition becomes more and more impaired, because the movement of the jaws in mastication is usually productive of pain of a character so intense that the patient dreads opening the mouth. It will readily be seen, therefore, that reflex action of the trigeminal nerve, or trifacial neuralgia, is one of the worst and most painful conditions which confronts the dentist in the treatment of diseases of the oral cavity, and often there is an utter lack of ability to give relief because of a faulty diagnosis. All treatment, whether surgical or therapeutical, must in more or less measure fail of satisfactory results unless we start with an intelligent perception of the causes which lead up to the trouble and their location. They may sometimes be difficult to locate, on account of their remoteness or a failure to trace them to a

definite nerve tract. It may often be found, however, in close proximity to the seat of disturbance, but wholly overlooked in searching for the cause in a remote part of the anatomy. A great deal of neuralgia of the face has a reflex origin, conditioned upon some irregularity in a remote part of the body. To these reflex forms belong those occurring in connection with chlorosis, hysteria, malaria, emotional excitement, constipation, etc. Well marked and authentic cases of reflex neuralgia have been found in connection with dysmenorrhea, stenosis of the os-uteri, and with diseases of a similar kind. The chief causes of neuralgia of the face are mainly the presence of tumors, syphilitic diseases of the brain and its membranes, and other diseases of the central nervous system.

There are, however, many local and less remote causes for reflex action of the fifth nerve, which are often overlooked and little understood, and whose influence is quite as potent as those of more remote character. One of these, and one whose action sometimes causes a most painful disturbance, is the presence of large masses of gold or amalgam in the teeth, placed there with the sole object of preventing the recurrence of caries, and in this respect these materials meet the demand, but their influence on the fifth nerve and its branches is so serious as to cause the possessor of them most acute agony. Nothing can be said against the manipulative skill of the operator who places these materials in teeth which cause such disturbance, but much can be said of his utter lack of knowledge, discrimination and judgment. Certain it is that in such cases the whole question of thermal changes, galvanic action, structure of the organs and existing nervous conditions, is entirely overlooked. Such cases are more frequently found in women, where the conditions for facial neuralgia exist as before mentioned, and where the hypersensitive structure of the tooth forbids the use of metal under any circumstances.

I may mention a case which recently came under my care and observation. A young lady, aged about twenty-five years, presented herself for treatment, saying that she was in constant pain of more or less serious character, and sudden change of temperature in the mouth occasioned intense suffering. The simple action of closing the jaws in mastication was productive of pain. An examination resulted in finding large masses of gold and amalgam placed in the teeth without the least reference to their baneful influence—large

gold fillings in interior proximal surfaces of molars (where it showed), and equally large amalgam fillings in the posterior surfaces of the same teeth (where they did not show). "Save the mark!" These fillings were all removed and replaced with cement and gutta-percha, and the patient is experiencing a comfort and freedom from pain which she has not had before in years.

The purely mechanical skill of those who operated upon the teeth was not in the least questionable, but the lack of intelligent discrimination was reprehensible in the highest degree. It is certainly better that no material of a greater conductivity than gutta-percha should be placed in cavities than that the patient should undergo constant torture by the presence of gold or other conductive material.

In some cases a particularly acid diathesis, such as an abnormal collection of lactic acid, may be the cause of reflex action of the nerve.

As regards treatment, it is important above all to determine the cause of the neuralgia and its location in a definite nerve tract. Only peripheral neuralgia, in the course of a definite branch of the fifth nerve, is adapted to operative treatment. The reflex forms of neuralgia are often satisfactory cases from a therapeutic standpoint, as they disappear at once and permanently upon the removal of the known cause. Neuralgia arising from central causes is the most unfavorable form for treatment and is usually incurable. It is sometimes difficult to determine in a given case whether we have to do with central or peripheral neuralgia. Cerebral symptoms indicate the presence of a central cause, although they are often absent.

The participation of other nerves in the disease is likewise an indication of a central cause, as well as the circumstances, when not the entire trunk but certain branches are affected. The way in which the trouble began often affords suggestions regarding the cause of the disease and aids in an intelligent diagnosis. Neuralgia arising from peripheral distribution in the case of the involved branch of the fifth nerve is best adapted for operative treatment. Division of the nerve (neurotomy) must always be combined with the excision of as large a piece as possible from the continuity of the nerve trunk (neurectomy), in order to prevent the divided nerve stumps from growing together. Still more effective is the extraction of the entire diseased nerve trunk, with its peripheral branches.

Stretching the nerve has also been recommended, either alone or combined with its division; but a definite judgment cannot as yet

be pronounced in favor of the therapeutic value of stretching the nerve in cases of neuralgia, for the way in which nerve stretching produces its effect has not yet been made sufficiently clear. It supposedly causes a traumatic neuritis and changes in some degree the relation of the nerve sheath to the nerve and its immediate surroundings.—*Pacific Gazette, Jan. 1899.*

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CHANGES OCCURRING IN SALIVA. By H. H. Boom, M.D., Philadelphia. Saliva is the mixed secretion of the parotid, submaxillary, sublingual, and subbuccal glands.—It is a slightly turbid, viscid liquid of a specific gravity of 1.002 to 1.008, and faintly alkaline in reaction.—Its approximate composition, in 1,000 parts, is water 995, solids 5.—The solid matter consists of ptyalin, mucin, salts, including chlorids of sodium and potassium, carbonates of sodium and calcium, phosphates of calcium and magnesium, and sulphocyanid of potassium, fatty substances, and traces of serum albumen and serum globulin.

The alkalinity of saliva is due to the presence of alkaline sodium phosphate ($Na_3 PO_4$) and sodium bicarbonate ($NaHCO_3$). There is a relatively large amount of carbon dioxid gas contained in saliva. The gas enables saliva to retain its salts, especially carbonate and phosphate of calcium, in solution. When the quantity of CO_2 is lessened, these salts are deposited upon the teeth as tartar, or often form concretions in the salivary ducts called salivary calculi.

The action of saliva in digestion is a three-fold one: (1) It acts mechanically as a lubricant and solvent of food. (2) Its ferment ptyalin by its presence causes the starch molecule of starchy food to unite chemically with a molecule of water, thus forming a variety of sugar. (3) When saliva is swallowed it acts as a marked stimulant of the gastric secretion.

The conversion of starch into sugar through the action of ptyalin of saliva was first demonstrated by Leuch. Three molecules of starch combine with one molecule of water, forming two molecules of dextrin and one molecule of dextrose or grape sugar (glucose), as

Starch. Water. Dextrin. Dextrose.

$$3C_6 H_{10} O_5 + H_2O = 2C_6 H_{10} O_5 + C_6 H_{12} O_6$$

(The student will observe that although dextrin has the same molecular formula that starch presents, yet the atoms making up its molecule are differently grouped, and result in a body, dextrin, pos-

sessing many properties different from those of starch.) This action of the ferment ptyalin, in converting starch into sugar, is called its diastatic action. One part of ptyalin is capable of converting two thousand parts of starch into sugar.

In health the saliva is alkaline in reaction, but the degree of alkalinity will vary in different individuals and even in the same individual at different times of the day. In some persons we may find a neutral or even slightly acid saliva, unaccompanied by any impairment of health.

We find the saliva acid in character from: (1) Decomposition of particles of food remaining in the mouth. (2) During fasting. (3) Inflammatory diseases of mouth or gums. (4) Catarrhal inflammation of alimentary tract. (5) Salivation, as from mercury. (6) Certain constitutional diseases, as in diabetes. (7) Certain local diseases, as in cancer of the liver.

Where decomposition of particles of food in the mouth causes acidity of saliva, we find lactic acid ($C_3\ H_6\ O_3$) and butyric acid ($C_4H_8O_2$), both resulting from putrid fermentation of starch and sugar, both liquid substances. Succinic acid ($H_2\ C_4\ H_4\ G_4$) has been obtained from saliva by Meissner. This acid, occurring in saliva, is probably formed through decomposition of meat particles (proteid.) It can be obtained by oxidation of many organic substances. When pure it is a crystalline solid of tablet-shape or needle-like prisms.

Although the mixed saliva in the mouth shows an acid reaction from the presence of these acids, if we touch a piece of litmus paper to the orifice of a salivary duct it will show a normal alkaline reaction of the secretion before it mixes with the contents of the mouth.

During fasting saliva frequently shows a neutral or faintly acid reaction. In such instances it is probable that this change is due to a relatively small secretion from the salivary glands mixing with a large quantity of altered acid mucus from the mouth. In inflammations of the oral cavity we find the saliva secreted in excessive quantity, mucus often dribbling continuously from the mouth. Such mucus, often yellowish, tenacious, contains squamous epithelia, fat globules, bacteria and debris of cellular matter. In such cases oxidation taking place yields a number of complex substances, some of which belong to the group of fatty acids. In inflammatory diseases of stomach or intestinal tract the patient frequently shows an acid condition of saliva. This is generally produced through

eructations of a gaseous acidulous nature, or regurgitation of acid liquid (water-brash). In such instance acetic, lactic, butyric acids may all be found in saliva. We may also find hydrochloric acid, especially in patients suffering from gastric ulcer. In chronic gastric catarrh, especially that form due to alcoholism, the expectoration of the morning will contain altered flakes of mucus and acetic acid from fermentative changes taking place in the stomach.

Where salivation from use of mercury is present the acidity of saliva can be traced to decomposition of altered, broken-down tissues. In diabetes mellitus the saliva never contains sugar, but in nearly all cases lactic acid will be found. In late stages of diabetes di-acetic acid has been separated from saliva. In gout and rheumatism the saliva has at times shown an acid reaction, due to lithic or uric acid ($C_5 H_4 N_4 O_3$), although it is more common to find uric acid in a combined form as urate of sodium, ammonium or calcium. Often these salts, acid in character (the acid urates), are deposited as concretions in the smaller joints and in other localities.

In the study of the cause of acidity of saliva it is of prime importance to obtain the reaction of the secretion by litmus paper as it issues from the salivary ducts, before it can mix with the materials contained in the mouth. As many cases of acidity of saliva are due to decomposing particles of food, all that is required to produce a normal condition is the observance of cleanliness and perhaps a mild antiseptic wash. When, however, the reaction of saliva is acid as it issues from the ducts, it indicates a more serious condition of a general systemic nature, the treatment of which must not be undertaken by unskillful hands.—*Stomatologist, Jan. 1899.*

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SOME GENERAL REFLECTIONS. By J. H. Woolley, D.D.S., Chicago. Read before Chicago Odontological Society, Dec. 1898. Four or five things have interested me in the management of devitalized teeth. 1. The use of heat as an agent for the destruction of pathogenic germs. 2. Does heat lessen the resistance power of enamel? 3. Reasons for embalming. 4. Obliterated canals. 5. Dangers in filling pulp-canals. The first point I have previously discussed. The second is, whether heat lessens the resistance power of enamel by the use of the root-drier. The affirmative of the question has been maintained by some, notably Drs. Black and Cook. It is my purpose to discuss only one point in a paper, written by Dr.

Cook, on "Heat and its Effect Upon Dentin." He says: "Raising the temperature of the root-canal drier from 90° to 130° C. for a few minutes would not be out of place, but if the temperature be raised to where you get the hissing sound with the root-drier, which is 170° C., there will be a drying out of the organic substance, thus rendering the tooth brittle;" which Dr. Black says, "lessens the resistance power of the enamel." This conclusion upon the part of both is reached by experiments made *upon teeth out of the mouth.* I would like to quote from Dr. Mathews, of the Physical Laboratory of the Chicago University, who has given some thought and opinions upon the effects of heat on dentin. He says: "The question arises whether or not in drying out the root-canal of the tooth, using the temperature high enough to render the canal aseptic, we lessen the resistance power of the tooth."

Generally speaking, a certain quantity of water is present in all substances, whether crystalline or amorphous. Certain crystalline salts hold a certain quantity of water, as water of crystallization, the drawing off of which by heat destroys the crystals ($CuSO_4+H_2O$); other substances, especially the colloid substances of the animal body, take up water by imbibition, the drawing off of which by heat renders them brittle and nonelastic.

Regarding the dentin of the teeth, which is composed of twenty-eight parts animal matter (colloid) and seventy-two parts earthy (inorganic matter), we know that none of the salts which form the inorganic part require water for crystallization; or in other words, their crystalline form does not depend on the presence of H_2O, as in the case of $CuSO_4$. The principal earthy salts entering into the formation of dentin are phosphate of lime, forming about eighty-six per cent of the earthy matter, carbonate of lime, traces of fluorid of calcium and phosphate of magnesium; none of which hold any H_2O in their crystalline form, at H_2O of crystallization (Remsen). Therefore, all the H_2O held in dentin is not held as H_2O of crystal, but held in the animal matter (colloid) by imbibition and in the tubuli and interglobular spaces. The drawing out of this H_2O from the colloid substance and from the tubuli of the teeth by heat would necessarily render the tooth temporarily brittle and nonelastic, as well as causing a shrinkage of the animal matter; but in the presence of H_2O or moisture the colloids would soon imbibe H_2O and return to their normal saturated condition. Therefore the application of heat can

destroy the resistance power or elasticity of dentin only so far as it acts upon the animal matter, and in this its effects can be only temporary. The tooth in a living subject can receive sufficient nourishment or the cementum still nourish it through the medium of the peridental membrane, and keep its healthy functional activity after the death of a pulp. This activity is manifested in various ways, one being in a constant and natural supply of moisture which the tooth receives in the mouth; another point, lost sight of in the experiments of Dr. Cook, is the per cent of loss of moisture in the crown in drying by heat.

Dr. Allport claimed in his experiments, confirmed by my own, that when the heated root-drier was passed into the root-canal the moisture to a considerable degree flowed back into the crown of the tooth on the principal of regurgitation, leaving the tooth unimpaired. By means of some statements I intend to show you by weight the loss of moisture in a few teeth out of the mouth after the use of the root-drier. The loss in some is small compared with the whole amount of moisture in the tooth before drying.

		G.	M. G.
	BICUSPID.		
1.	Before desiccating	1	4902
	After	1	4732
	Loss		0170
	MOLAR.		
2.	Before desiccating	23	5902
	After	23	5696
	Loss		0206
	MOLAR.		
3.	Before desiccating	25	2832
	After	25	2018
	Loss		0814
	CENTRAL INCISOR.		
4.	Before desiccating	23	4472
	After	23	4404
	Loss		0068
	MOLAR.		
5.	Before desiccating	24	1708
	After	24	1412
	Loss		0296

The following example of the power of a live body to resist heat has been given by Tait. In a baker's or sculptor's oven at a temperature far above the boiling point of water, on one occasion even

at 320° F., so high indeed, that beefsteak was cooked in thirteen minutes, Tillet in France, and Blagden and Chantry in England, remained for nearly an hour in comparative comfort; but though their clothes gave them no great inconvenience, they could not hold a metallic pencil case without being severely burned.

Embalming.—By the aid of the root-drier we dry the canal and destroy any microorganisms that may have been left there. After thorough dryness has been obtained we flood the canal with eucalyptus, which by imbibition is carried into the dental tubules of the root, after which the surplus of this antiseptic is removed by the aid of cotton or other absorbents. By this treatment the root-filling seals up the intertubular spaces, preventing any microorganisms finding their habitat there. Thus the root is embalmed, and we then proceed as in point five.

We now reach the fourth point, obliterated canals. It had been commonly believed that when signs of an obliterated canal were discovered, it had better be undisturbed, on the ground that no future trouble was likely to arise; but the contrary has been my experience upon examining many cases, taking considerable time and trouble. I have found within one-half of a line of the apical foramen an open canal containing pus, showing the presence of pathogenic germs. This opens up an interesting subject, namely, whether the excursion of these germs has carried them through the less organized structure of the canal, or through the blood into the apical space, thence to this open canal at the end of the root. A paper by Dr. Leon Williams on the structural changes in the enamel bears on this subject. He has shown by photographic cuts that microorganisms have attacked the cement substance, uniting the enamel rods, and have also made further excursions into the dentin. Is it not possible, then, that in the same manner microorganisms can move along the line of the obliterated canal, which is unorganized dentin, down to the point where an open one presents itself, and infect it also?

Fifth. Danger lines in filling pulp-canals. There are certain conditions to observe in root-filling, which if neglected abort the end in view. A sense of pressure noted by the patient will determine whether the filling has reached the apical foramen; but we must also be able to determine whether this pressure is from the filling or air. There is no better way to avoid confusion here than by

observing certain rules in the following order: Apply the cofferdam and dry the root-canal and embalm as in point three. Second, flood the canal with chloroform, and by the movement of the broach back and forth in the canal, air bubbles will escape. Afterward work chloro-percha into the canal. A new danger arises here—i. e., in the act of removing the broach air will rush into the pulp-canal. This can be avoided by seizing the broach with pliers and drawing it slowly out; leaving gutta-percha in its place.—*Review, Jan. 1899.*

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BRONCHITIS AND PNEUMONIA CAUSED BY INHALATION OF FILLING FROM A BROKEN TOOTH. By Dr. Chas. O'Donovan. On March 21, 1891, I was asked to see Mrs. F. B., white, aged forty-six, married, mother of three children, the oldest about twenty-three. She was a stout woman, of medium height, with very florid complexion, who had always been healthy, except for occasional colds that were hard to shake off and often caused mild bronchitis. On the day before she had had a tooth extracted under the influence of nitrous oxid by a perfectly competent dentist, but he had broken the tooth and had caused her a considerable amount of pain in the operation. She took the gas only once, but did not recover well from the inhalation, feeling very much "stuffed up" after returning home and breathing with difficulty. She thought she had taken cold while at the dentist's, but paid little attention to the matter, fully expecting to be rid of it by the next morning. On the contrary she was much worse; she had a very restless night, sleeping but little on account of oppressed breathing, and being distressed by a teasing but uncontrollable cough, which was rasping and dry, coming on in paroxysms, but giving rise to no expectoration. I examined her throat and chest very carefully, but could detect nothing wrong; so I ordered a simple expectorant, containing a slight amount of morphine, and told her that she would soon be all right. By the next day I had reason to change this opinion, for I found her in the same condition, having coughed nearly all night, her nervous system rapidly showing signs of distress, her pulse up to 110, and temperature to 101 degrees, and a process of bronchitis developing in the medium-sized bronchi about two-thirds down the right lung and midway between the spine and the axillary line. From this the bronchitis spread in a few days throughout the entire lower third of the right lung, with consider-

able elevation of temperature and quickened pulse rate, accompanied by great prostration. At the same time her expectoration became quite free, beginning as mucus and froth, but rapidly becoming purulent. Meanwhile the other lung remained perfectly clear throughout. In spite of absolute rest in bed, the best of nourishment, excellent nursing, and various different expectorants and sedatives, she grew worse daily; lost her appetite, slept very irregularly and without refreshment, bowels became costive, cough continued, complained always of an oppression about her chest, and began to have a cutting pain in the right lung with each cough or forced inspiration. On April 10 a distinct dull spot was made out just where the original focus of inflammation had been; it was not pneumonic, it had no tendency to spread, but seemed to be a dead, flat spot about as large as a pigeon's egg, surrounded by an area of dull, infiltrated tissue, that faded imperceptibly into the bronchitis surrounding the area. The spot grew slightly larger as time passed, but no new foci developed anywhere else; the upper two-thirds of the lung remained clear and resonant, but the lower third was very dull upon percussion, almost approaching a hypostatic pneumonia, with moist râles in the medium and finer tubes to be heard all through the inflamed area. The left lung showed also some few moist râles, but no dullness. She had every evening a rise of temperature to 102 to 104 with a fall during the morning to 99 to 100. She was evidently very ill, but unaccountably so. Tuberculosis was thought of, as her family history showed some taint, but the sudden onset and anomalous development of the trouble made it unlikely. However, some of the sputa was examined and showed no bacilli. Her nourishment was forced, and she was encouraged to sit up awhile each day, but she was not improved, and asked to be allowed to stay in bed. Quinin and other antipyretics were given, but had no effect upon the fever, which became more and more hectic in character, with chilly sensations before the rise, and the expectoration began to have blood in it in increasing quantities, never any large amount, but quite as much as in pneumonia. By the end of April the original spot showed evidence of softening, and the formation of a cavity soon followed; it was clearly defined, not larger than a walnut, with well-marked amphoric breathing, some egophony, but very little or no bubbling. In the rest of the lung there was no change in the general condition, the area of inflamma-

tion and infiltration did not extend, nor did the bronchitis show any sign of improvement. After consultation the condition was readily agreed upon, but no reason could be assigned for this trouble, nor could a satisfactory prognosis be given. Her cough continued to be always troublesome, interfering much with rest at night, and giving rise to a very free expectoration of thick yellow stuff, with frequent admixture of a little blood; pulse was rather hard and jerky, beating about one hundred to the minute, and temperature was constantly above the normal, with a suspiciously regular rise each afternoon. Except for the inability to find bacilli, and her excellent health in the past, I should have diagnosticated tuberculosis without hesitation. All through May and early June she continued in this condition. She had a trained nurse, who devoted great care to her nourishment, that being given the first place in treatment rather than any medicines; of these, various expectorants and tonics were used, including a fair allowance of whisky. As a result she lost no flesh, rather gaining than otherwise, and presented no appearance of illness beyond the frequent cough with expectoration. Her symptoms, however, pointed to a very serious condition. She described herself as constantly breathing with the greatest oppression, and so weak that the slightest exertion caused her to become faint and brought on severe paroxysms of coughing, although she was forced to get up every day in spite of daily protests. The lowest third of her right lung became gradually water-logged, with general diffuse bronchitis through it, giving rise to moist râles everywhere with exudation and infiltration, especially as the original focus was approached, this being a cavity surrounded by a zone of consolidation. In the left lung some bronchitis appeared also, but this affected only the medium-sized tubes and did not produce much extrabronchial infiltration. On June 17 she went to Atlantic City, being in the same general condition, with oppressed breathing, frequent cough, much purulent and some little bloody expectoration, no appetite, but taking food under compulsion, sleeping badly, and in a very wretched frame of mind. It was hoped that the sea air would benefit her, but she failed to respond in any way to the change. On July 7—more than fifteen weeks from the time that she so suddenly and peculiarly developed her bronchitis—in a severe paroxysm of coughing she spat up, with the usual purulent and bloody mucus, a piece of amalgam filling from the broken tooth,

smooth on one surface, but very rough and jagged on the other, where it had been joined to the decayed and excavated remnant of the tooth; it formed approximately a paralellogram, measuring half an inch long, three-eighths of an inch wide, and having a thickness of an eighth of an inch; it weighed 28.11 grains. Although very doubtful of the final outcome of such prolonged irritation, I wrote most hopefully and advised her to stay at Atlantic City. At first her improvement was very slow, causing much discouragement and leading her to leave the seashore early in August for a Blue Ridge mountain resort. Here she grew gradually stronger and better, gaining in various ways. I did not see her until late in September, when I found her practically well, except for the cavity in the right lung, evidently the place where the foreign body had been lodged. This cavity, although perfectly apparent and readily made out, was much smaller than it had been in June, and slowly contracted during the succeeding months, disappearing finally during the winter. She continued for several years more than usually susceptible to colds, and always found with each new cold that bronchitis was apt to develop in the right lung with a good deal of pain at the site of the cavity. In time this disappeared also, and she is now (October, 1898) perfectly well.—*N. Y. Med. Journal.*

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LIPS AND THEIR PATHOLOGY AND TREATMENT. By C. Bunting Colson, M.D., D.D.S., Charleston, S. C. Read before Georgia State Society, June, 1898. For my subject I have chosen the lips and adjacent parts of the face about the mouth, and the hands; the therapeutics and pathology of same, with treatment. The normal lips need no anatomical description here, yet the purely normal one is by no means common, as a very large percentage of lips of our American people are rarely normal, as the lips most frequently show the evidence of almost all the pathological conditions of the system. The lips are the frame when the teeth become the picture, and let the picture be ever so beautiful, if poorly framed it loses its harmony. It is not necessary for a lip to have the artist's idea of an ideal bow to be pleasing, if it presents that healthy tint, delicate hue and softness common to mucous tissue in the young. All healthy adults should have nearly the same, as the mucous membrane changes little with age, and if the lips are properly treated they should be just as bright and pink at fifty as at sixteen. The

chief causes of the various pathological conditions of the lips are the habit of biting and sucking them, causing unusual development of certain parts and chronically enlarging the vessels by biting and bruising, and the lack of care of protecting them from cold winds in our unnatural life of civilization.

Chapped Lips.—Dentists need no description of them. All winter they are with us daily, and many appointments are postponed or sittings curtailed on their account. But this to me now is a thing of the past. They have no more terror for me, and to those who do not know how to master them, I here bring a boon for their winter operating. In the early spring morning there comes into your office a young and beautiful woman—"sweeter eighteen," as some modern poet has put it—all beautiful and fresh as spring itself; appointments such as hair, nails and complexion, dress and half-hidden lingerie perfect. She takes her seat in your chair for you to examine that erupting "wisdom tooth," but you cannot get there. At the first stretch she recoils and you let go, to see the blood burst through a crevice in her lip; you examine and find it like serrated parchment. She knows the art of keeping her hair light and fluffy and sweet, and the art of manicuring, and how to make up and to wear her beautiful spring clothes, and perhaps of keeping her teeth clean, through your previous counsel, but the art of keeping her lips healthy she knows not of. I have been told (I know not from experience) that kissing such a girl in the dark, hands down, is like kissing a grater, and I cannot but think my informer right.

Split Lip.—Here is another pathological condition we frequently meet, which makes operating difficult. This condition is almost invariably caused by sucking the lip and causing some unnatural development of one side or both, and bringing a fold either in the center or on the side near the corner; more often found in the male, and hardest to cure in the smoker; the inflammatory condition is most positively parasitical.

Fever Blisters.—This acute inflammatory condition characterized by the development of a group or more of vesicles on a patch of inflamed mucous membrane, or on the skin near the mouth, is to my mind also purely parasitical, although frequently appearing after some digestive derangement or febrile condition; but this means simply the favorable condition for the development of the ever-present spore waiting its chance.

We have elderly patients, and sometimes children of the slums, come to us with the chronic sore or inflammation of the corners of the mouth. Usually the old ladies have a plate and it is very poorly cleansed, but the true cause is the drooping corners of the mouth, when the saliva, gravitating to the corners, escapes slightly and causes the inflammation. In the children poor general hygiene and the dribbling habit most commonly cause this condition. It is also a parasitical complication, because you cannot cure it without good germicidal and antiseptic treatment.

Treatment of the Lips.—In the treatment of the above ailments that I venture to present to you, are ideas well matured. How should the healthy lip be treated to keep it so during the several changes from moist and warm to dry and cold that are so severe on all exposed tissues of the body, and especially the lips, as they are of such delicate texture? The mucous membrane of the lips needs protection against these thermal changes, and that which is placed on them must be compatible with their functions and conditions. For this purpose a standard formula has been used for many years, but with poor results. I refer to cold cream. What is cold cream? Oil of almond, spermaceti, white wax and rose water. Here we have on an excretory mucous surface, frequently flushed with mucous and water, an ointment incompatible with moisture or mucous. Its action is only temporary, mechanical, and has positively no therapeutic effect. A mucous surface will not absorb or retain either a vegetable or animal oil, and cold cream remains only by common adhesion for a short time, and then leaves the surface exposed, having accomplished nothing except the temporary mechanical covering.

Glycerin and Rose Water.—The only thing that I have found in the entire pharmacopea that will combine with the mucous tissue and the skin and not impair function, is glycerin. Not simply glycerin, and not without certain precautions and directions. Glycerin is not an oil, and pure glycerin is one of the best-known emollients. The common article found in ordinary drug stores is positively irritating to the human skin, and is also slightly caustic. Therefore in making the following preparation, precaution as to purity should be observed to get satisfactory results. Take of pure glycerin one ounce; rose water one ounce; place in three ounce bottle and agitate for several minutes and then set aside for several

hours or over night, so that the glycerin will take up the water and destroy any anhydrous or caustic property it may have.

Now if the lips or skin about the mouth, chin or nose are to be protected, moisten the parts with warm water and dry same by sopping with a soft towel, without wiping or friction, and instantly apply freely the glycerin and rose-water mixture with fingers. This done once a day on retiring, or to those peculiarly predisposed to chap twice a day may be necessary, is positively a preventive, and will hasten the recovery of an already troublesome case.

In a case where lips are badly broken and bleeding, and the hands roughened and cracked, we find here the under skin in a high state of hyperemia. It is not well to leave this alone, for if your glycerin is not the purest and the tissues not well saturated with water, it will cause pain on application and increased redness. It has been the most common and rational treatment to use witch hazel, but I have since used a preparation for this condition that I wish to call to your special attention, as its effect is charming and wonderful in restoring the hyperemic condition to normal, instantly stopping all pain in the parts, and by no means incompatible with the glycerin and rose water that may be applied a few moments after. This preparation is known as resinol. I have been familiar with it for several years, and the more experience I have with it the more infatuated I become with its excellence.

Resinol.—This is only its proprietary name. It is not a quack preparation. It has for its combination the wonderful oil of cade, the active principle of the juniprunus oxycedus, the oil of juniper, lanolin and petrolatum, and a synthetical derivative of those wonderful coal tar preparations. I have never been able to find its equal in dissipating capillary congestion, and as a local application for all such pathological conditions it is my *ne plus ultra.* It has wonderful power to subdue localized pyrexias. For instance, in that turgid fold of tissue over a third molar, that no balm yet known to me will subdue under hours of treatment, this little salve will calm, subdue and reduce in an extremely short time. In the very worst case of chapped lips, rub resinol well over them and go ahead and operate. Your patient will have no distress, be the operation ever so long and extensive, and the next time she appears those lips will be as soft and pliable as an infant's.

The next cases that worry us are the fever blisters or cold sores.

Not so much in the early stages, when they only sting when touched, but when they are healing and form scabs that crack and bleed and are very painful. Since resinol has come to my knowledge these cases worry me no more. I apply the ointment before touching the teeth, and it is wonderful what an amount of stretching and handling those lips will endure, and what is still more startling is to find those lips two days after almost normal and no signs of inflammation. Fever blisters on my own lips I often abort when fresh by using on them, on first discovery, hydrogen dioxid and then touching with resinol, which as I have said before has a most wonderful power of reducing subdermal inflammation of a local character.

Soap for Dentist's Hands.—A busy dentist washes his hands scores of times a day, using soap as he should almost every time. How important it is to keep our hands soft and free from cracking, and this can be done only by using a proper soap. The brands in soap are too numerous to mention. Some of the most popular and freely advertised are the greatest frauds, and have almost as much free alkali as soft soap of war times, or common washing soap. The best soap I can find for a dentist to use is the white rose glycerin No. 4711, made at Cologne. This has a minimum of alkali free, and will prevent chap in ordinary circumstances, and with the aid of the glycerin and rose water used at night on retiring will resist chap under almost any condition and keep the hands soft and pliable. It is also economical, as it never splits and washes to a wafer, and does not discolor the water in the basin, and has an acceptable scent that will disguise the foul odors which we meet with in mouths. The hands washed with that soap always seem pleasant and clean to a patient.—*Items of Interest, Jan. 1899.*

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ARSENIOUS TREATMENT FOR THE REMOVAL OF TUMORS FROM THE MOUTH. By Dr. J. L. Mewborn, Memphis, Tenn. Read before Tennessee Dental Association, July, 1898. Case No. 1. In 1876 Maggie H——, eight years old, was brought for the removal of two lower deciduous incisors, and I found all the upper deciduous teeth firmly in position, and located on the gum above the right cuspid and molars was a liver-colored tumor, the size of a nickel, its surface was convex and smooth as glass, with margin as well defined as the setting of a watch crystal. After a few days the surface began to break up into a warty appearance with

a tenacious yellow exudate from its surface. My proposition to remove the growth with arsenic was received with strenuous opposition by the half dozen leading physicians whom I had assembled for consultation. Holding my proposition in abeyance, I agreed to try any other remedy they might suggest. On the supposition that tardy replacement of the deciduous teeth might be an exciting cause, I agreed to and did extract the right central, lateral, cuspid, first and second molars—all temporary teeth. This removed all restraint, and in a week the tumor had extended down and inward to the center of the roof of the mouth, becoming as large as a hickory nut. Next the whole surface of the tumor was pierced in every direction with a pointed orange-wood stick, being dipped in C. P. nitric acid before each puncture. This seemed to stimulate vascular action and caused the whole surface to sprout out, giving it the appearance or a cauliflower. After the third day this treatment was abandoned. By this time three weeks had been wasted in delay and treatment, which had only stimulated its growth until now the lips could not cover it nor the teeth be brought together. The child was beginning to show and feel the lack of proper nourishment, and the tumor was growing at a fearful rate. The father fully realized the exigency of the case when I assured him that heroic treatment could be no longer delayed. The surgeons had insisted that the knife and bone forceps were the last resort, but I explained to the father that this meant chloroform, the loss of a great deal of blood, the destruction of bone and germs of teeth sufficient to disfigure the child for life, together with fever and possibly erysipelas for several weeks. "Now shall we adopt this or my remedy—arsenic, a virulent poison?" To my gratification he agreed with me, and in less than a minute the whole operation was done. After piercing the lobulated structure of the tumor to its center, I carried to this point on a forked instrument a small pellet of cotton saturated with twice the amount of arsenious paste used for devitalizing the pulp in a tooth, nothing more. In five days the whole thing sloughed away, leaving a clean hole down to the exposed crowns of the advancing permanent teeth, and in three weeks this was filled with new tissue. No pain was inflicted, not a drop of blood lost, no reactionary fever supervened, and the child stopped playing only long enough to spit the thing out. Ten years afterwards, when she was eighteen years

old, I made a cast of her mouth, which showed a perfect arch and complete denture.

Case No. 2. A few years after this a negro woman reported that while having a lower tooth extracted the forceps suddenly flew up, striking the right upper central with great force. Soon afterwards a tumor began to grow from the injured pericementum, and continued to enlarge for a year. Several teeth had been removed to make room for it. When it came into my hands it had protruded from the alveolus directly to the front, and looked like an Irish potato sticking out between the lips. This was treated in a similar manner, with good results.

Case No. 3. An old market woman reported with a firm, knotty growth from the periosteum of the lower cuspid. This projected against the lower lip, and was the size of a filbert. One application of arsenic, as in No. 1, effected a permanent cure.

Case No. 4. Last May Mrs. H—— came to me with a lobulated tumor, one-half the size of a walnut, growing from the pericementum of the right upper cuspid, which had been removed with the hope of arresting the growth. It was pedunculated, as most of these tumors appear after taking on rapid growth. It was May 11 that I made the arsenic application, just as in Case No. 1. On the 14th I removed the blackened mass by manipulating it with a pair of foil pliers, bringing with it one or two long filaments, resembling roots, which penetrated deep into the still empty tooth sockets. This patient returned home on the 16th, and like the others had no pain, loss of blood, destruction of healthy tissues, nor any subsequent effect which would give the least annoyance whatever.

In making a brief report of these four cases I have purposely avoided all characteristic indications which would aid in any way to determine whether they should be classified as vascular, fleshy, glandular, fibrous, cartilaginous, osseous, or cystic tumors. These indications are not reliable, because they are not uniform in the different stages of development or growth of the tumor, therefore do not in every case indicate or determine the course of treatment. As the most reliable guide for the adoption of the arsenic treatment I would lay down the following rule: On any growth or tumor, either sessile or pedunculated, which arises from the alveolar region of the upper or lower jaw—which has a distinct line of demarcation, and can be punctured to its center with a spear-pointed instrument

—use the arsenic without hesitation. If there is no line of demarcation, but a general infiltrated appearance of all surrounding parts, send the patient to the surgeon with your compliments. If the tumor cannot be penetrated with an exploring needle, it is cystic or osseous, and would require the gouge and burring engine to break it down.—*Dental Headlight, Jan. 1899.*

A LONG WAIT.—They tell of a Chicago physician who, opening the door of his consultation-room, asked: "Who has been waiting the longest?" A tailor who had called to present his bill rose and said: "I have, doctor; I delivered your clothes to you three years ago."—*Chicago Clinic.*

FISSURE OF THE TONGUE:

℞	Acidi carbolici	1.5 parts
	Tinct. iodi	5 parts
	Glycerini	15 parts

M. S. For local application with a camel's-hair brush.

—*Monatssch. f. Dermatol.*

ENLARGED CERVICAL GLANDS.—When a patient comes to you with enlarged lymph-nodes of the neck, be sure to examine the throat most carefully. If the patient is a child, remember that a very common cause of lymph-node inflammation is the presence of hypertrophied tonsils or of adenoid vegetations. In an individual of middle age, examine any hypertrophy critically, bearing in mind the possibility of neoplasm.—*International Journal of Surgery.*

DANGER SIGNAL IN CHLOROFORM.—R. Lehmann states that if the patient keeps his eyes completely or partially open during the narcosis, and opens them whenever you try to close them, you can expect some accident, more or less severe. This phenomenon was noted 21 times in 329 anesthesias, and in each one there was either continuous vomiting, arrested respiration, peculiarly protracted agitation, or asphyxia and syncope, requiring artificial respiration.—*Semaine Med. Nov. 2.*

FOREIGN PRACTITIONERS IN BERLIN.—The police authorities in Berlin have issued an order which is of special interest to foreign physicians and dentists. It is permitted to display the title of "Arzt" (physician) upon a "shingle," provided it is at the same time designated where that title has been obtained, *e. g.*, "N——, Doctor of Dental Surgery, of Chicago," etc. The native medical men have taken stand against this order upon two grounds: First, because German physicians have not the same rights in other countries, especially in Switzerland; and secondly, because it is a useless order in Germany, where, in fact, anybody may practice the healing art. The profession is, however, making strenuous efforts to terminate by legal means and measures this freedom of practice, but the success of such endeavors is at least problematical. Many persons of political influence have come out against the physicians, maintaining that everyone has a right to select his own executioner, and may physic himself to health or to death as he may elect or as chance may decide.

Letters.

NEW JERSEY LETTER.

EAST ORANGE, N. J., February 21, 1899.

To the Editor of the Digest,

MR. EDITOR:—The late winter and early spring appear to be the right time for banquets in the dental world, and it seems to us to be the proper season for holding same.

On the 4th instant Dr. J. Allen Osmun, president of the state dental society, tendered a complimentary dinner to the officers and executive committee of the society and a few invited guests. It was given in his new home at Glen Ridge, and was a very sumptuous affair. It was preceded by the semi-annual meeting of the society, at which time all the committees for the year were appointed, except one or two whose labors are so arduous that the selection is made in the early autumn.

The essayists and subjects for the summer meeting are about arranged, and at this early date the meeting gives promise of so much interest that it will be well worth traveling from distant points to attend. The meeting-place as usual will be at Asbury Park, and an innovation will be tried this year in having only two sessions daily, morning and evening, leaving the afternoon free for the enjoyment of the seashore, etc.

Exhibitors are already taking space, and the prospect bids fair for the largest and most extensive exhibit ever appearing before any dental convention. The whole main floor of the auditorium will be given up to it, and the meetings will be held in the annex room, as well as the clinics, which it is intended shall be extraordinary this year.

Last evening the Central Dental Association held its annual banquet at Newark and about 150 were present. It was to be regretted that at the last moment Gov. Voorhees was detained by legislative duties and so could not be present, but the other speakers made up for his absence.

Dr. Stockton spoke of the nineteen years of work done by the association, and the high success that had been attained in the character of its meetings, many of the most eminent men in the pro-

fession having been brought before the various sessions. He paid a fitting and richly deserved tribute to Dr. Chas. A. Meeker, who was really the founder, and during all these years has been the spirit and life of the society.

Dr. Luckey dwelt upon the ethics of our calling and made some very strong points upon the future of the code and its influence in making and keeping members professional.

Dr. Adelberg was as usual witty to the echo, and his remarks fell upon ears attuned for their enthusiastic reception.

Dr. G. Carleton Brown, of the Committee on Colleges of the National Association of Dental Examiners, explained our new dental law and pointed out wherein it is stronger than those of either New York or Pennsylvania. It requires a practical as well as a theoretical examination, and has one clause providing for inter-state exchange of licenses, which is a commendable idea and should be followed by other states.

Dr. Osmun outlined the purposed features of the coming state meeting, just enough to whet our anticipations.

The retiring president, Dr. Riley, delivered the address of welcome and made some suggestions as to the future work of the society.

The meeting closed with the following election of officers: President, Charles S. Hardy; Vice-President, Herbert S. Sutphen; Secretary, C. W. F. Holbrook; Treasurer, Chas. A. Meeker; Executive Committee, F. Edsall Riley, C. W. Hoblitzell, W. H. Pruden, W. L. Fish, J. S. Vinson.

Fraternally yours, HORNET.

NEW YORK LETTER.

To the Editor of the Digest, NEW YORK, Feb. 22, 1899.

MR. EDITOR:—We believe that a little history would not be out of place at this time, and as we are not under the necessity of drawing upon outsiders for our facts, we feel morally responsible for what we write. It is not our object to create controversy, but to avoid it. Nothing can be plainer than that there is a lurking but strong spirit of overthrowing the products of Dr. Williams. No one can fail to notice the remarkable kaleidoscopic charges which have occurred, and were first manifested before the First District Society when Dr. Williams made his debut in New York. Long previous

to this he had been presented to the late Prof. Heitzmann by ourselves, and was cordially welcomed into all the privileges of this marvelous teacher's laboratory. Naturally enough Williams brought out what he had been doing in microscopical work, and to the credit of Heitzmann be it said, that he warmly commended the work as being the finest he had ever seen. It should be carefully noted that Williams was a self-made microscopist, and unlike others, did not copy his works in pencil, but allowed nature to do its own portraying.

As he had accepted Heitzmann's courtesies it was demanded that he follow the latter's methods. Suffice it to say that Williams did not prolong his work, but quietly dropped out through the influence of the late Dr. Atkinson, who had immediately seen the superiority of Williams' purpose and future efforts to bring out the exact portrait of the work, knowing that there could be no dissension from what was put upon the screen. Everything brought out at this recent meeting was in Williams' mind at this early day, not only the portrait of nature, but putting aside all possibilities of any freaks that only a mature microscopist and photographer could detect. These facts have revealed that such freaks were possible, and that they lead to erroneous conclusions. Some of Williams' former articles showed that such things have occurred, and that they could mislead even a sincere investigator who was not an adept in the action of certain attitudes of the microscope.

No one will wonder at the natural outcome of Williams coming so favorably to the front before a New York audience, right in the face of Heitzmann's supreme control, and he did not emanate from Heitzmann's laboratory. We do not mean to detract one iota from the latter's ability, for he was deservedly proud of his pupils, and was always present to coach them, but he had admitted the superiority of Williams' work and confessed that the latter had views original with himself, even though they differed decidedly from his own. So when it was announced that Williams was to take the field to controvert the man in command, a feeling of jealousy was at once engendered, and reason and courtesy seem to have been dethroned. He was not to be met as a brother scientist, but as an interloper. It is easy to imagine Williams' disappointment. Up to this time he had not been much in association with our profession, and knew scarcely anything of the men he had heard of, so that he must have

been shocked by being ushered into such an atmosphere as greeted him.

Prof. Heitzmann was strongly denounced by his warmest friend, Dr. Atkinson, yet it was ever afterward apparent that cruel jealousy was rampant. Dr. Atkinson and ourselves often expressed to Dr. Williams our earnest hope that he would not let anything of a personal nature thwart his ambition to investigate. Doubtless the delay occasioned by his establishing a practice had no little influence over his mind, and we now see that it proved a strong factor in producing the marvelous micro-photographs that he has presented. In the days of waiting he perfected his ability in the photographic art, perhaps little thinking that it would play such an important part in his future scientific labors.

In some of our former letters we stated that he had produced some valuable works, which were brought out by Putnam and Scribner of New York—scenes from Sleepy Hollow on the Hudson, the haunt of Washington Irving; and the early life of Shakespeare at Stratford-on-Avon. These views were the personal work of Dr. Williams and have proved an artistic and financial success.

In the February *Items* Dr. Hart says that some of Williams' pictures are out of focus. He may or may not know that Williams is an acknowledged expert in photography, and unless he is one also we should advise him to be a little chary about making such charges.

We learn that Dr. Williams has returned from London, but will not be able to resume his work for some months. We trust he will heed the warning which has been given by his recent illness, and hereafter be more wise in the conserving of his strength.

There is a young woman in a New Haven hospital "whose third molars are growing horizontally in her jaws instead of vertically. She is suffering great pain, but the physicians have been unable to afford any relief. They are unwilling to extract the teeth for fear of breaking her jaw." It looks as if the physicians needed some dental education. What business have they anyway with such cases. As dentists are seeking an alliance with them, let us hope that they will be able to give the medical profession some alphabetical teaching.

A still worse case is reported from Meriden, Conn., where a dentist attempted to extract sixteen teeth. A physician administered

chloroform, and after two teeth had been extracted the patient was found to be dead. The medical examiner who was summoned concluded that death was due to strangulation, the chloroform having closed the throat and the tongue having fallen back. It ought to be a criminal act for any dentist to extract sixteen teeth, except in the most extraordinary case, and those physicians who administer chloroform should be competent.

Theodore A. Havemeyer, a well-known millionaire of this city, recently earned $4.00 by sitting on a jury which acquitted a man charged with practicing dentistry without being registered.

Cordially, NEW YORK.

SPECIALISM IN MEDICINE.—"When the profession fully realizes that there is a difference between the true specialist and the exclusivist, who knows only his own branch, however well that may be, and when the broadest medical education and experience are recognized as the only fit qualifications for the true specialist, there will be an improvement in the grade of special consultants and a higher meed of praise for those whose opportunities, talents and labor have raised them from the rank and file of the general profession to positions of eminence as consultants in regard to particular classes of diseases."—*Dr. L. Duncan Bulkley.*

LAW OF PENNSYLVANIA.—Judge John D. Shafer filed an important opinion at Allegheny, Pa., January 3, 1899. A dentist wished the recorder to show cause for not registering him, and the recorder stated that the proper certificate from the State Board of Dental Examiners had not been presented, as required by the active assembly. The petitioner claimed that he had practiced dentistry in that county for six years. Judge Shafer finds that the practice of dentistry is now regulated by the act of 1897. All former laws on the subject are therefore repealed. It was held that the act does not apply to any dentist practicing before October 1, 1897. The court continues:

"It is true that the only direct and positive prohibition of practice is contained in section 13, which provides that after October 1, 1897, it should not be lawful for any person in the state to enter upon the practice of dentistry. Section 14, however, provides that 'nothing in this act shall be construed to prohibit the practice of dentistry within the commonwealth by any practitioner who shall have been duly registered in accordance with existing laws.'

"If the statute were not final it might be that taking these two sections together they might be held to prohibit the practice of dentistry by any unregistered person after October 1, 1897. The petitioner did not, however, enter upon the practice of dentistry after October 1, 1897. But whether he could be convicted of a misdemeanor created by section 13 does not now concern us. He is certainly not entitled under the act to be registered in any form. Even if he were, we do not see how upon such a proceeding as this he could obtain any relief. His only remedy would be by mandamus."

The Dental Digest.

PUBLISHED THE TWENTY-EIGHTH DAY OF EVERY MONTH
At 2231 Prairie Avenue, Chicago,
Where All Communications Should be Addressed.

Editorial.

UNIFICATION OF STATE DENTAL LEGISLATION.

This question is discussed at length by Dr. Edward C. Kirk in a paper published in the February *Items of Interest*. The article goes so much into detail that we cannot publish in full, and therefore will give a brief digest of it with our comments. The writer first emphasizes what he styles the most prominent characteristic of dental legislative effort, namely, its heterogeneous character; and owing to the fact that the effort has the same objective point in each case, the diversity of methods invoked for the accomplishment of a common purpose stamps most of it as defective. Second, that much of dental legislation owes its existence to the efforts of practitioners to protect themselves against the competition of their unqualified neighbors, and as this is class legislation, such laws are fundamentally defective and would not stand a judicial test.

In making his criticism of the laws generally enacted the writer commits an error in laying the blame of these defects to the promoters of the laws, namely, the respectable practitioners, when as a matter of fact the faults and changes in what would have been a good law are generally secured by the disreputable practitioners, whose freedom is likely to be affected by such legislation, and by the bogus colleges for similar reasons. These two bodies generally have sufficient influence to make almost any bill defective before it becomes a law in the ordinary legislative body, so that in order to be passed it is necessary that the proposed law shall not interfere with any of the evils already in existence.

In the second place, all dental laws are primarily intended for the protection of the community and not the dentist, for if there were no incompetents all laws of this kind would be unnecessary.

The first recommendation of importance that the author makes, is to relegate the licensing power to the state instead of to the colleges, and that its execution be vested in properly constituted state

boards of dental examiners, which bodies he highly commends, with the condition that the licensing examination in all its details and results be made a matter of record open to inspection by all parties interested, with adequate provision for appeal in all cases of errors or injustice in its conduct. Such a proposition is certainly reasonable, and is an improvement over many of the laws enacted, whereby a college diploma is recognized as sufficient evidence of the qualification of the holder.

Another important question which is discussed is the method of appointing the examiners. The author says they should be nominated, if not directly elected, by state societies or chartered local societies, for the purpose of excluding political influence. This is all very well theoretically, but there is another party to this agreement, the governor of the state, who often has the candidates for appointment selected by his political coworkers, and the candidates in many instances are neither members of any society nor recognized as professional men. The governors are usually willing that the state societies shall make recommendations, but they generally reserve the right to do as they please afterward, and not infrequently ignore entirely such suggestions, so that this makes the appointment of state boards very uncertain, and is one of the serious defects of this plan.

The most interesting part of this subject was the discussion which occurred after the reading of the paper. It was apparent that all who took part desired a unification of the dental laws, and different members from the three states of Pennsylvania, New York and New Jersey congratulated themselves upon how much better their respective laws were than those of other states. But the universal commendation of Dr. Kirk's paper was changed when Dr. Ottolengui took the floor. He was surprised that the essayist was so much in love with dental examining boards, and said that he considered them the greatest evil which ever befell the profession of dentistry; but admitted that they were a necessary evil, because the colleges could not be trusted.

The trend of his argument was to the effect that if the colleges graduated only men who were fit to practice dentistry there would be no need of examining boards, and he submitted a proposition that had been given to the National Association of Dental Examiners some time ago, which was as follows:

"Let us do away with State Examining Boards, and call them State Boards of License. Let them give a man a license to practice. Now what shall be the basis upon which a man shall demand such a license? Let him present to the board a diploma from a properly chartered college, submitting with that diploma the original examination papers upon which that college granted him his diploma. The result would be justice to the student.

"In all these discussions, we always consider the rights of the profession, of the colleges, of the examiners and of the public, but what of the student? The student, when he goes to a college and pays his money for a dental education, has a legal right to demand enough knowledge to practice dentistry, and when he gets that from his preceptors, he should not be compelled by a state board to answer a question, the answer to which was never taught him when he was in school. He should be allowed to say: Gentlemen, I have a diploma, and they gave it to me upon these papers. If you think that these papers justify my receiving the diploma, you must give me my license; if you do not think so, you must quarrel with that college, and see that it gives out no more diplomas to men who cannot practice in your state."

Dr. Kirk replied, and as he is dean of a college naturally felt called upon to defend them. Among other things he said:

"Dr. Ottolengui proposes a substitute for the examination of the graduate, viz., the examination of the college. I have always embraced the opportunity, wherever it has presented, to examine the details of mannfacturing industries. I am interested in these things. I like to get into a factory and see how it is conducted, and I have noticed in factories that it is part of the industry to have a method of inspection. But inspection is applied to the product. An inspector does not go round and look at the machines or the walls or the workmen, but he applies his investigations to testing the character of the product. Now that is what we are doing with the dental examining boards."

The editor of the *Cosmos* is known to be an expert in putting the wrong parties on the defensive, and in this case he certainly outdid himself and was hoist by his own petard. It is not the examining boards that are at fault, and we quite agree with Dr. Ottolengui that it is the colleges which should be on trial. The question of the factory product was well answered by Dr. Ottolengui in the editorial pages of his journal, apparently as an afterthought, but no less forcible on that account. We give only two paragraphs from this able editorial:

"The product of a factory, to follow Prof. Kirk's analogy, is subjected to inspection, and the inspector may reject it on the ground that it does not measure up to the required standard. What is the result? The rejected product is a burden or loss to the factory. Does this part of the analogy hold good with the college product? The college product, being the graduated student, applies for inspection by a state board of examiners and is

rejected as not measuring up to the standard. The burden of loss falls on the young graduate and not upon the college. The product suffers instead of the factory. Thus, an analysis of Prof. Kirk's analogy shows, first, that it is analogous, and second, that it fails in being analogous by disclosing, that whereas inspection of factory product properly fixes the loss, on the other hand the inspection of the college product improperly fixes the loss, and thus works an injustice. * * * It would be interesting to have a legal test of existing conditions made in the following manner: The student having paid for a dental education fitting him to practice his profession, and having received a diploma from his college certifying that he is fitted to practice, upon being refused a license by a state board, might bring a suit for damages against his college, on the ground of breach of contract. The case being tried, the verdict would be instructive whatever it might be. If the college were sustained, the state board would be proven to have illegally withheld the license. Whereas, if the state board were supported, then it would become manifest that the college standard was not high enough, and this in turn would properly reflect against the Faculties and Examiners Associations which had given such an impotent institution recognition."

We took counsel on a similar proposition some years ago, and were advised that the colleges could be held responsible, or laid themselves liable for damages, when they granted diplomas to unqualified students. This is the most interesting phase of the subject, and will undoubtedly arouse much discussion.

PRACTICAL RESULTS OF HIGHER EDUCATION.

There is so much discussion just now concerning the colleges and greater qualifications of students, that we reprint in full an editorial from the last *International.* It deserves attention not alone because Prof. Truman is one of the oldest and most competent teachers in this country, but also because of the important points raised:

The problems in education will never apparently cease to be a source of anxiety to those engaged in training young men for service in the world The effort to prove that the thoroughly educated man is the best man for all business and other relations has been continuous for years, while the opposite view is stoutly maintained that a theoretical education will disqualify for practical service in proportion to its extent and thoroughness.

That there is much truth on both sides of this much mooted question must be admitted. The thorough mechanic may be developed from the man who has devoted his years to the study of the classics, while it is possible to make a learned man from the blacksmith at the forge, a fact frequently demonstrated. The result depends entirely upon the taste of the individual. The scholar may be a mechanic by inclination and habit of thought. Once started in this direction he will not only make a good mechanic, but will broaden the entire work through the intelligence acquired in other direc-

tions. This is equally true of the mechanic. The surgeon may be learned in medical science, but inability to use the instruments required results badly. It is frequently painful to witness the attempt to perform an operation by one who has never acquired skill in this direction.

While it is true on both sides of the argument that here and there exceptional cases pass over the borderland into the domain of the other, it yet remains a fact that the higher the training the lower the mechanical ability. This apparent paradoxical condition of things will probably not be admitted by those who have to deal with dental education, but it has become a serious fact in dental teaching. The cry for years has been for a higher standard. Dentists of the present and future must possess not only a preliminary education of a very high grade, but they must during the college term be trained in all the collateral branches supposed to be of special value to the medically educated student. This has grown year by year until the dental student has been loaded down with an amount of scientific training that absorbs nearly all the three years devoted to the study of dentistry. It is plain that he cannot accomplish two extremes, and as usually happens he drops somewhere between, being neither a dentist nor a mechanic.

The writer has been impressed with the fact for years that dentistry upon its practical side has been languishing through higher training. The dentists of to-day are not as a rule equal as operators or mechanics to those who graduated when two years was the maximum limit of school work, while they are measurably superior in all that appertains to higher scientific culture. The work of filling teeth is not by the majority as dexterously performed as it was twenty years ago. Then good operators were the rule, now they are the exception. Forty years ago dentists were expected to be able to manufacture metal plates with the skill of the jeweler. Now both operator and plate-worker are to a great degree lost in the higher training; and unless measures be taken to effect an equilibrium between the theoretical and practical, it will not be a generation before the good name of American dentists will be measurably lost in both branches.

It must be apparent to all dental educators that a remedy for this must be found, and that speedily. The students of our best dental colleges are overworked mentally and physically. The curriculum is crowded with subjects. The so-called technic training absorbs altogether too much time in the freshman year. A limited amount of this is essential, but the student, at the earliest period, should be placed at the threshold of his serious work in life, upon the living subject. The Technic Association recently met in Cincinnati and spent two days discussing these preliminary problems. While this may be well, and the time and money expended not lost, yet it does seem to the writer that there is altogether too much of this kind of work required in the schools. If this technical work is to be continued and extended, then we may look forward, not to a four years' course, but to a five or even six There must be a limit found somewhere to this overloading.

The work, as now performed, would probably not be a serious drawback to acquirement of skill were it properly systematized, but this cannot be done in dental schools as now managed, for the teaching there is not done by

men trained for the special purpose of teaching, but by persons taken from the ranks of practitioners, whose livelihood is dependent, not on the emoluments derived from teaching, but from practice. This divided loyalty produces the legitimate result—imperfect work in the, to them, least important duty.

There is another point worthy of the earnest consideration of dental educators. Many of the dental colleges have selected for the most responsible position, that of dean, a practitioner of medicine. However worthy and skillful in his own line of work, he is not fitted by training or inclination for that duty. The result is a lamentable weakness everywhere. This selection is in direct opposition to all experience. The large mechanical establishments would treat with ridicule the proposition made to place at the head of any one of these as general manager a man trained in law, theology or medicine, yet this is exactly what is being done in many of our dental colleges. A dental college is a large manufacturing establishment, and to conduct it rightly it must be managed by men trained in that direction and upon strict business principles, or it will be a failure.

Is there any remedy for the condition that confronts dental educators today? The answer to this must be found somewhere and somehow. In the opinion of the writer the solution of the problem must be in an entire reorganization of methods. Pedagogy is a recognized science, and must be applied here as elsewhere. There is a class of mind in every circle that tends in certain directions. It is this variety of intellect that gives force to all the occupations of life. Some will incline to mechanics, others to the purely professional, some find pleasure in teaching. In dental training the latter are indispensable, but as affairs are now managed these are practically lost.

The first duty of those engaged in dental education would seem to be to select young men exhibiting this talent and train them for the work. Place them first in subordinate positions, and as they show ability in imparting knowledge make their positions permanent at a continually increasing salary, so that all temptation to practice may be eliminated. In other words, make the position one of life interest, as in other important occupations.

Then systemize the whole method of teaching. Give the student elementary technics, but as early as possible place him on the living subject. Utilize every hour in the day, that no time be lost. Do away with all useless modelling in clay, or carving in other material, making drawings of teeth on paper, or measuring angles of excavators and pluggers, and in the place of these time-wasteful methods, add on the higher branches and extend these to the fullest extent compatible with time and the strength of the student. Make the course four years of nine months each of continuous labor.

It may be said that this is a Utopian idea and can never be carried out. It is to the writer a very simple problem. It will of course mean the destruction of many dental colleges, for it is understood that there are many schools in small places that would find it impossible to meet these demands, but on the other hand, there are colleges now established that could do this and could well afford to make the experiment. The question must be met, for the schools at present are drifting along with haphazard methods that were

sufficient for the requirements of the past, but are wholly unsuited to this age, when the demand is for cultivated minds combined with manual dexterity.

Dentistry needs all the intelligence that it is possible to acquire, and it would be folly to eradicate the higher mental development, as it would be equally disastrous to eliminate practical skill. Both must go together, and that college will serve the profession best which can demonstrate the way whereby both can be conserved to the advantage of dentistry and to the benefit of humanity.

We cannot agree that "the higher the training the lower the mechanical ability," for the exact opposite is true—the higher the mind is trained the more skillful will the individual be mechanically. All other things being equal, the educated boy will far surpass the ignorant one when it comes to mechanical training, for the reason that a disciplined mind can better understand and more readily reason out the whys and wherefores, and will therefore more easily understand what is required. If the views advocated by Prof. Truman on this point were correct, then the preliminary education now urged as a requisite would be detrimental.

The fact that students are loaded down by the required course of study, and when graduated are neither dentists nor mechanics, must be accounted for on other grounds. Twenty years ago a student entered college only after a course of training in some practitioner's office, and if found unsuited in any respect was generally dissuaded from pursuing the course. Now all is different. A young man decides that he wishes to study dentistry, and no one discusses or advises with him in the matter. Colleges are numerous, and in almost any locality he can find one to take him in, so he enters, usually not having the faintest conception of what qualifications are necessary to make a good dentist, and believing the practice of dentistry to be merely an easy means of making money.

While the curriculum of studies has been increased, the quality of students admitted is much lower, and as they are often undisciplined in mental labor, when a good teacher presents a scientific subject they can neither grasp the thought nor concentrate their minds upon a study of the question. When you add to this fact, as stated by Dr. Truman, that the teaching is done mostly by men untrained for the special purpose, is it any wonder that the country is full of failures?

Instead of lessening the technic training we should advocate more

of it as being the very thing which would give some of the needed skill. We do not mean the making of instruments and work of that kind, but refer to operative and prosthetic dentistry. If every practitioner would prepare and fill a few cavities in teeth out of the mouth, and examine the results under a good magnifying glass, it would be a great object-lesson to most of them, as they would see the defects which cannot be detected in the mouth.

We must protest earnestly against the proposition that the student should begin early upon the living subject. First, because he is entirely unfit for such work, and can gain his experience much more readily in working upon teeth out of the mouth. Second, because it is most unjust to the patient. If students were allowed to practice upon and mutilate dumb animals, as they do human beings, it would be stopped by the Humane Society, and very properly. Third, because a large infirmary practice seriously handicaps the younger practitioners of a city.

To secure manipulative ability, more hand-work must be insisted upon. The engine should not be used until the senior year is reached, for excavators rather than burs should be employed in preparing cavities; and gold fillings should be put in with hand-pressure.

There is another reason why the young men of to-day are not so good operators as those of twenty years ago, viz., the almost universal crowning of badly decayed teeth. Formerly they were built up and the contour restored with gold, skillfully manipulated, and thus the mouth was made much more comfortable, and the operator's working qualities kept in perfect condition. But now when a tooth is badly decayed, it is cut down or off and the root crowned, and this procedure has been a ruination of good dentistry and a source of much disreputable practice. Thus good operators are now the exception.

The alarm sounded by the editor of the *International* cannot be heeded too soon, and we believe the remedy will come through the plan suggested—reorganizing the educational system, increasing the mental requirements for matriculates, and weeding out and consolidating the large number of schools now in existence. To know that so experienced a teacher as Prof. Truman advocates a radical change in the existing conditions is surely encouraging, and we recommend a careful reading of his views and a study of this important subject.

Notices.

EASTERN INDIANA DENTAL SOCIETY.

The Eastern Indiana Dental Society will hold its annual meeting at Marion, Ind., May 3 and 4, 1899. The profession in this and neighboring states are cordially invited to be present. F. R. HENSHAW, Sec'y.

VERMONT STATE DENTAL SOCIETY.

The Vermont State Dental Society will hold its twenty-third annual meeting at Burlington, Vt., March 15–17, 1899. Headquarters will be at the Van Ness House. A cordial invitation is extended to all members of the profession to be present and take part in the discussions. THOS. MOUND, Sec'y.

CHESTER AND DELAWARE COUNTY ASSOCIATION.

The annual meeting of the Chester and Delaware County Dental Association was held January 25, 1899, and resulted in a pleasant and profitable meeting. The election of officers was as follows: President, R. M. Scott; Vice-President, F. M. Smith; Secretary, J. H. Campbell; Treasurer, Harry L. Smedley. Executive Committee, S. B. Luckie, C. H. McCowan, A. H. Grubb.

PORCELAIN DENTAL ART CLUB.

A porcelain dental art club was organized in St. Louis Feb. 22 for clinical experiments and the reading of papers on porcelain work in dentistry. J. H. Kennerly, M. C. Marshall, H. Prinz, W. F. Lawrenz, J. G. Harper, H. M. Hill, F. E. Turner and B L. Thorpe constitute the charter members. H. M. Hill was elected President, F. E. Turner Vice-President, and B. L. Thorpe Secretary and Treasurer. Dr. Kennerly read a paper on the "Revolution of Tooth Crown and Continuous Gum." The next meeting of the club will be held March 22.

SOUTHERN BRANCH OF NATIONAL DENTAL ASSOCIATION.

At the annual meeting of this organization, held at New Orleans, Feb. 9-13, 1899, the following officers were elected: T. P. Hinman, Atlanta, Ga., President; H. H. Johnson, Macon, Ga., First Vice-President; J. P. MacDonald, Shelbyville, Tenn., Second Vice-President; S. G. Loff, Greenville, Tenn., Third Vice-President; C. L. Alexander, Charlotte, N. C., Corresponding Secretary; S. W. Foster, Atlanta, Ga., Recording Secretary. D. B. Brabson, Knoxville, Tenn., J. G. Fife, Dallas, Tex., and A. R. Melendy, Knoxville, Tenn., were elected to fill vacancies on the Executive Committee.

MASSACHUSETTS BOARD OF REGISTRATION.

A meeting of the Massachusetts Board of Registration of Dentistry will be held in Boston, March 20, 1899, at 11:30 a. m., at 563 Tremont st., for examination of candidates. Examination in operative dentistry at 12 o'clock. The theoretic examination will be held at State House Civil Service Rooms,

at 9:30 a. m., Tuesday. Each candidate must come prepared with rubber-dam, gold, and instruments, to demonstrate his skill in operative dentistry. All applications, together with the fee of $20.00, must be filed with the secretary of the board on or before March 13, as no application for this meeting will be received after that date. G. E. MITCHELL, Sec'y, Haverhill, Mass.

LATEST DENTAL PATENTS.

30,035. Design, Crown-piece attachment, Charles Rozell, Hutchinson, Kas.
32,399. Trade-mark, Receptacle for tooth powder, Thomas Hollis, Boston.
32,479. Trade-mark, Tooth-paste, S. S. White Dental Manufacturing Company, Philadelphia.
617,777. Dentist's mercury holder, Carl Schweizer, Philadelphia.
618,000. Floss-holder for cleaning teeth, Wm. J. La Varre, Washington.
618,105. Tooth regulator, Miland A. Knapp, Minneapolis.
618,166. Composition of matter for producing enamel for refixing dental plates of artificial teeth, Thomas Clarke, Interlachen, Switzerland.
618,248. Antiseptic soap, Robert Ehrhardt, Augsburg, Germany.
618,224. Dental plugger, Robert Blum, Corpus Christi, Texas.
618,349. Disinfecting apparatus, John A. Heany, assignor to J. W. Douglass, Philadelphia.
618,421. Dental appliance, Israel S. Kirkwood, Chicago.
618,690. Rotary tooth brush, Adrian M. W. Laag, Phillipsburg, St. Martin, West Indies.
619,188. Cotton box for dentists, Israel S. Kirkwood, Chicago.
619,226. Dental chair, Frank Ritter, Rochester, N. Y.

News Summary.

S. D. KING, a prominent dentist of North Dakota, died suddenly Feb. 21.

H. D. MORGAN, a dentist of twenty-five years standing in Chester, Pa., died Feb. 12.

PRACTICING WITHOUT A LICENSE cost two dentists in St. Louis $50 each Feb. 16, 1899.

SAMUEL E. HAINES, 50 years old, a dentist of Philadelphia, died Feb. 19, of typhoid fever.

G. FRED. TUCKER, an old established dentist of Hutchinson, Kan., died Feb. 11, from heart disease.

W. W. MORGAN, 70 years old, once a wealthy dentist of Camden, N. J., died of bronchitis Feb. 14, 1899, in a Philadelphia lodging-house.

ANDREW W. FREEMAN, a dentist of Chicago, died Feb. 23, aged 70 years. He was one of the pioneer dentists of the city, having come here in 1854.

PATENT MEDICINES.—A bill was recently introduced in the Illinois Legislature "to compel all manufacturers of patent medicines to take out licenses, pay fees for the privilege of doing business, and make their formulæ public.' The bill is not intended to pass, but to scare the manufacturers.

STERILIZE YOUR INSTRUMENTS.—A woman died a short time ago in Indiana from blood poisoning, following the extraction of several teeth, and a suit for damages is imminent.

LOUISIANA STATE BOARD.—On Feb. 7 the governor of Louisiana appointed a state dental board as follows: C. V. Vignes, Wallace Wood and Charles Mermilliod, New Orleans; C. B. Johnson, Monroe; R. L. Zelenka, Houma.

DENTAL DEPOTS VS. MECHANICAL DENTISTS.—A dentist who saw the little notice about Sibley's dental laboratory in last month's DIGEST has written in as follows: "The Marshall Dental Mfg. Co. of Iowa; Morrison Bros. of Tennessee, and the Macon, Ga. Dental Depot, do the same thing, and it seems to me that if people who depend upon the patronage of dentists for their support compete with them in business, the only remedy is to stop dealing with such firms until they come to their senses." It is a noteworthy fact that all four firms involved belong to the combination.

INDEX TO ADVERTISEMENTS.

DR. J. LEON WILLIAMS,

who stands pre-eminent among dental authorities, declares that almost all softening of the enamel and structural decay of the teeth are due to the action of acids excreted by bacteria in the mouth. He says: "My own opinion, based on an experience extending over five years, is that we can place in the hands of our patients the means of preventing at least two-thirds of the dental decay now prevalent."

Dr. A. C. Hart likewise declares that by preventing the growth of bacteria in the mouth, he can preserve the teeth of his patients indefinitely.

The late investigations of the special committee appointed by the New Jersey State Dental Society to search into the subject, demonstrated that the safest, most effective and available antiseptic and disinfectant adapted to dental and oral prophylaxis, was a new and powerful germicide, which scientifically combines the cleansing, healing and preserving properties of Eucalyptol, Tymol, Formaldehyde, Boric Acid, Menthol, Cinnimic Aldehyde, Benzoin, Myrrh and Wintergreen.

"Dentacura," the name given to this new agent, derives its remarkable germicidal power from its chemical property of **UNITING with the bacteria** and combining with the nitrogenous and albuminoid matter found in the mouth, and **TRANSFORMING both the bacteria and the products of decay into new and true chemical compounds, which are not only sterile and odorless, but often are actually antiseptic themselves.** It thus annihilates the very principles of fermentation and decay and must from necessity conserve to the preservation of the teeth.

Before the investigating committee of the New Jersey State Dental Society placed Dentacura at the head of all Dental and Oral Prophylactics, Dr. S. C. G. Watkins, the Chairman of the Committee, states in a letter published in the January *Items of Interest* that "After a most conscientious and unbiased examination of the leading antiseptics and dentifrices, and an especially close observation of the action of all such, **in cases of inflamed and spongy gums, pyorrhoea alveolaris, and excessive accumalations of salivary calculus,"** he prepared the report which "conclusively demonstrated" that **Dentacura "possesses all the requirements of an ideal prophylactic."** Dr. Watkins further affirms that "the statements presented by the Special Committee on Prophylaxis to the New Jersey State Dental Society are indisputable facts, and any honest and thorough investigation will justify all the findings presented in that report."

In Dentacura, Dr. Williams' statement is more than verified. "Every dental practitioner can place in the hands of their patients the means of preventing at least two-thirds of the dental decay now prevalent," and can maintain the mouth in such a perfect state of antisepsis as to prevent most if not all of the dental and oral diseases characteristic of bacteria infection.

Dentacura Co., Newark, N. J., invite correspondence from the profession and shall be pleased to send literature and samples of Dentacura.

DO YOU WANT A LIFE INCOME OF $125 PER MONTH?

SAFEST AND MOST PROFITABLE INVESTMENT IN THE WORLD.

PAYMENTS.		DIVIDENDS. (Over and above payments.)	
First year, $12.50 month	$150.00	Sixth year	$ 450.00
Second year, deducting dividend	138.00	Seventh year	1,075.00
Third " " "	93.00	Profit	$1,525.00
Fourth " " "	20.40		434.70
Fifth " " "	36.30		
Total cash invested	$434.70	Net surplus	$1,090.30

Eighth to fiftieth year, annual income, $1,000 to $1,500.

This statement shows the actual cost each year of carrying five acres to maturity in the Mexican Plantation Association, and means that, at the end of the third year, the investor has practically paid for his shares, and at the end of the contract the money invested has been returned with a profit of $1,090. The net annual income thereafter will be from $1,000 to $1,500 for at least forty years. Don't say that we promise too much. These figures are not paper estimates and they are not ours; but are based on the average results now being obtained in Mexico, according to the English and U. S. consular reports and all authorities on tropical agriculture.

OUR PLAN—NO CHANCE TO FREEZE OUT.

This is not a stock company, but a co-operative association, and each share represents an acre, but an acre in the form of an undivided interest, the plan being to run the plantation jointly forever. The interest of one is the interest of all and each member has only one vote, no matter how many shares he owns. This makes it absolutely impossible for large holders to take any advantage. The association has 6,000 acres and is planting rubber, chocolate, coffee, tobacco, etc. Its officers, who have had ten years' successful experience in developing large plantations, contract for $350 an acre to scientifically cultivate the land for seven years and bring it to full maturity. They make their profit out of the contract. The $350 is paid in 84 installments—$2 50 per month for 48 months, $5.00 for 26 months and $10 for 10 months.

CHICAGO TITLE AND TRUST CO., TRUSTEE.

The land has been deeded to this strong financial institution, which also receives the money paid by the members and transfers it to the contractors only upon evidence that the work is being faithfully done.

A GUARANTEE BOND OF $100,000

has been approved by and deposited with the Trust Company, and is for the purpose of indemnifying the members, if the contractors fail in any of their agreements, and positively assures the scientific development of the land—obviously the pivotal point.

FIRST DIVIDEND, 10 PER CENT, MAY, 1899.

This will come from a crop of tobacco now nearly matured and very promising. Thereafter steadily increasing dividends will be paid in cash by the Trust Company each year and reduce the investor's net cash outlay as shown in the table above. Inspectors will be elected annually by the members to visit the plantation and make an exhaustive report. The first one goes in April. Over 100 men are now clearing the land under the supervision of expert tropical horticulturists.

OVER 1,500 MEMBERS—70 PER CENT SOLD.

In this number are several Chicago dentists; for instance, J. H. Prothero, Northwestern Dental College; L. W. Nevius, 1319 Champlain Building; H. A. Freeman, Evanston; F. E. Reynolds, Sixty-third and Stewart avenue; C. C. Shimp, White Dental Supply Co.

The shares are selling rapidly and the books will soon be closed. If you can possibly spare $12 50 per month take five acres and secure an independent life income. If you can't carry five, take less. Fill out the blank application and mail it with $2.50 for each share and your contract and pass book will be sent you. If inconvenient to send the first payment, mail the application anyhow, and you can make your first payment in April. Remember that you can lapse at any time for three months, and it is the consensus of opinion of the members that within a year the shares will bring a premium, which will increase annually for ten years. This insures the ready sale of your shares at a profit, if unable to keep up your payments.

If you want to investigate further, our literature will be sent upon application. Address all communications to the special agent,

J. M. RUSSELL,

1603, 100 Washington Street, CHICAGO, ILL.

APPLICATION FOR CONTRACT.

_____ 1899.

MEXICAN PLANTATION ASSOCIATION:

I hereby make application for _____ shares in the Mexican Plantation Association.

_____ Name.

J. M. RUSSELL, AGENT. _____ Address.

Mail this to J. M. Russell, 1603, 100 Washington Street, Chicago.

The Trust Houses

Are now granting the following munificent discounts for spot cash:

3 Per Cent. on Bills from $ 5.00 to $ 25.00
5 Per Cent. on Bills from 25.00 to 100.00
10 Per Cent. on Bills Over 100.00.

The Dental Protective Supply Company since its organization has given **10 Per Cent Discount** for cash on all goods of its manufacture to members of The Dental Protective Association, no matter how small the purchase.

We have done this to benefit the members of the Association, and to show the non-members, that by joining and taking advantage of the discount they could, in a short time, save their entrance fee.

Can this move on the part of the Trust be an attempt to check the growth of The Protective Association. When the combination becomes philanthropic we are naturally suspicious.

..Matinum..

A Substitute for Platinum in post metal for crowns.

FOR several years efforts have been made to supply a metal to take the place of platinum for post metal. There have been several metals put on the market, but they have failed to give entire satisfaction as they oxidize under heat and in most cases discoloring the cements they are set in; also post breaking off in the root, letting the crown off.

Matinum's specific gravity is less than platinum, and costing less, will go about two and a half times as far.

Matinum in heavy post can be used in stiffening large pieces of bridge work; also in filling up large bicuspid and molar dummies.

Matinum will not oxidize in the flame of a Bunsen burner; comes out the same as platinum.

Matinum will take the highest kt. solder.

Matinum is stiffer than pure platinum.

Put up in two-pennyweight rods, 75 cents per rod.

Shapes round, square and three-cornered.

Gauges (U. S. gauge) 16, 17, 18.

W. L. MASON, Manufacturer,

P. O. Box 392, Red Bank, N. J.

ORDER THROUGH YOUR DEALER OR DIRECT.

FOR SALE BY

Dental Protective Supply Co.

Found at Last.

The great fault hitherto existing in angular handpieces has been that the proper combination of gears, which would give all the required angles and yet be strong enough to withstand the great strain, was not found. In our new

"No. 1" Angle Attachment

we have succeeded in overcoming this difficulty, and we will guarantee it to require less repair and to outwear any angular attachment now on the market.

It can be attached to our "No. 1" Handpiece, or to a No. 6 or No. 7 Handpiece.

As will be seen from the cut, the bur can be held at either an acute, right or obtuse angle.

A No. 2 right angle bur can be used, so that no extra expense is necessary for special burs.

Finally, **the price is right.** Why pay more when you can get the best and most scientifically made Angle Attachment on the market for

$7.00.

Dental Protective Supply Co.,

1101 CHAMPLAIN BUILDING,
CHICAGO.

"NO. 1" HANDPIECE

Patented Feb. 5, '95.

Designed and Manufactured by

The Dental Protective Supply Co.

A glance at the accompanying cuts illustrating this Hand piece will demonstrate the simplicity of its mechanism.

We have endeavored to design and place before the profession the most simple and durable Handpiece made.

The special features of the Handpiece are the double end chuck, the improved locking device, and long and efficient bearings.

Ample provision has been made for taking up all wear, and we guarantee that if the bearing surfaces are kept clean and well oiled, that this Handpiece will last for years, and prove the best that has ever been placed upon the market.

It is adapted to hold different forms of bit shanks (except cone journal) which can be inserted or taken out from the Handpiece while the engine is in motion; it is also designed so that it can be attached to any Dental Engine, and will fit all ordinary right angle attachments.

Owing to the entire absence of screws the Handpiece can be taken apart without the use of wrench or screw-driver, and is so constructed that escape of oil upon the hand of the operator,—an objectionable feature in some handpieces—is entirely avoided.

In ordering our No. 1 Handpiece, it is essential that you give all necessary particulars as to the style of your engine and attachments

PRICE - - - - $10.00.

—ORDER DIRECT FROM—

THE DENTAL PROTECTIVE SUPPLY CO.

CHICAGO, ILL.